# PIT AND QUARRY

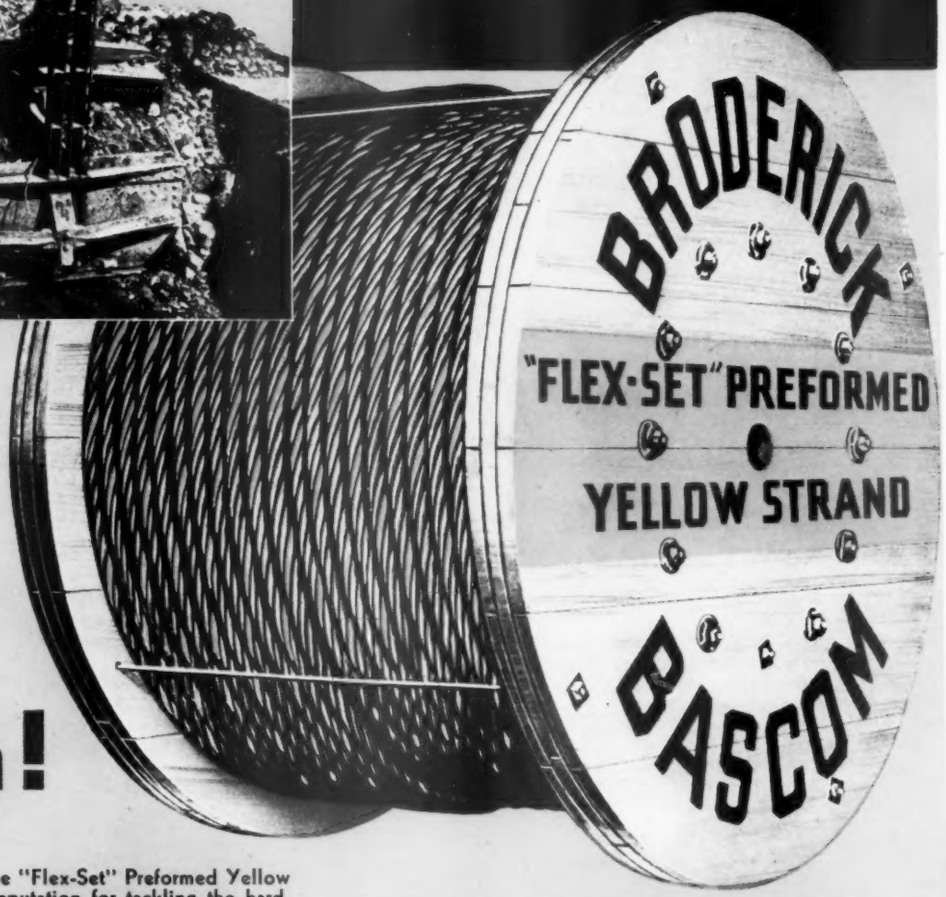
MAY, 1939

Recent Developments Among Lime Plants . . . Two Clay-Brick Pioneers Now Making Concrete Units . . . Silica-Sand Producer Cuts Strip-Hauling Costs

**FREE** RIGGERS' HAND BOOK

55 pages of just the information every rigger needs and wants. Write today for your copy. No charge. No obligation.

# "Flex-Set" Preformed YELLOW STRAND




# It's Tough!

Yes, tough is the word—because "Flex-Set" Preformed Yellow Strand has a well established reputation for tackling the hard, grilling jobs, and doing them well—and economically.

The same specially drawn wire is used that put Yellow Strand wire rope at the very top years ago. It still must pass searching tests in the B & B laboratory. But now the wires are pre-shaped to the helical form they occupy permanently in the finished rope.

And what is the result? *Longer life* — because the rope is practically pre-broken in, rotation on sheaves and drums is greatly reduced, and there is remarkable resistance to kinking and fatigue.

Where the job is tough—on power shovels, dragline machines, derricks, excavators—let a tough rope do the work. That's "Flex-Set" Preformed Yellow Strand.

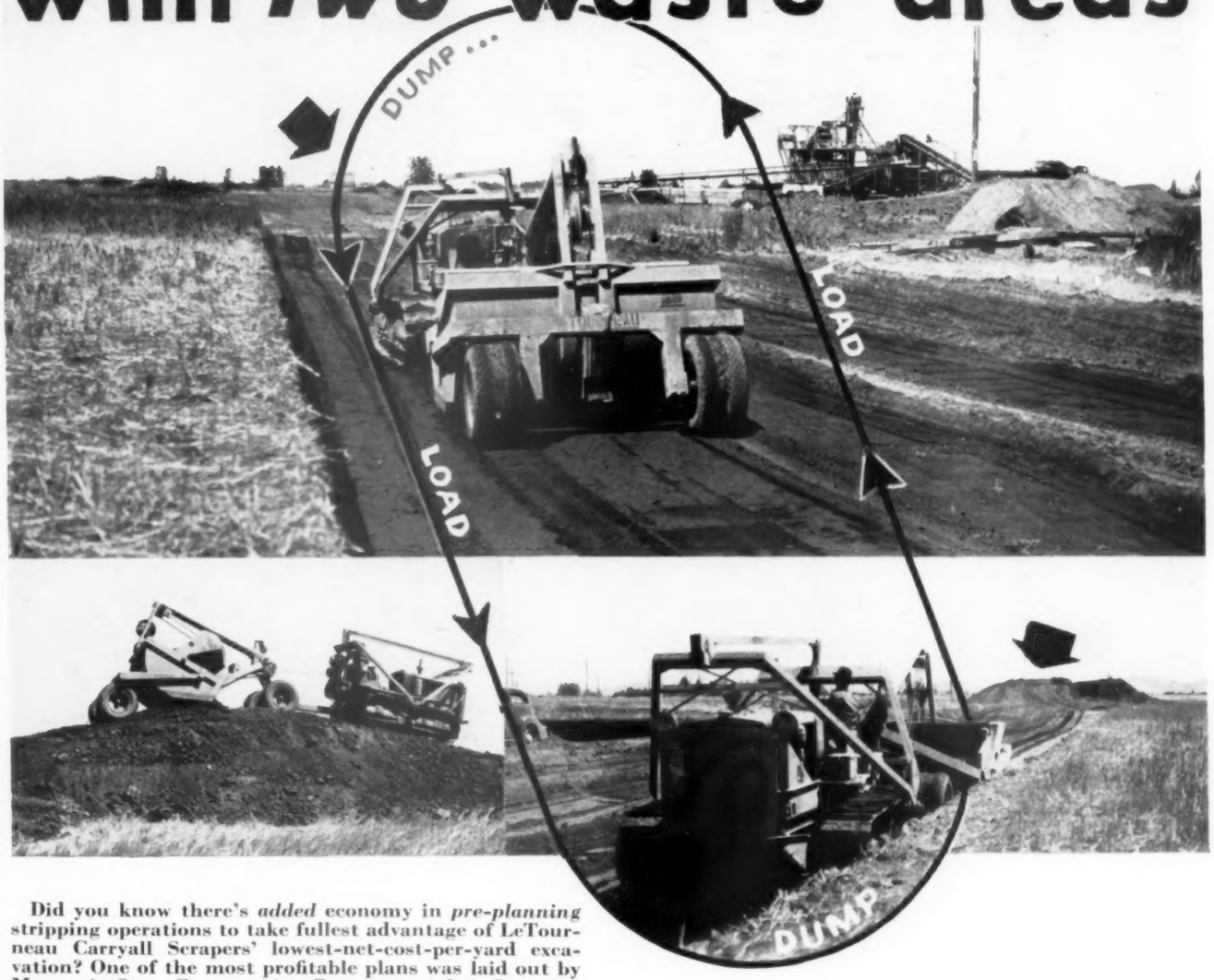
## Broderick & Bascom Rope Co., St. Louis

Factories: St. Louis, Seattle, Peoria

Branches: New York, Chicago, Seattle, Portland, Houston

U-15R7

# There's *No Waste..* with *two* waste areas




Did you know there's *added* economy in *pre-planning* stripping operations to take fullest advantage of LeTourneau Carryall Scrapers' lowest-net-cost-per-yard excavation? One of the most profitable plans was laid out by Mountain State Construction Company at their Junction City, Oregon, gravel pit. They've established waste areas at either end of their pit . . . to eliminate all idle traveling time . . . and make hauls pay *both* ways!

Their LeTourneau Model "G" Carryall loads six and more loose yards of sod and soil each pass across the pit. Figuring on a 350-foot haul each way, the continuous cycle of profitable operation averages 120 loose yards dug, delivered and dumped every hour. Good production for one man—the D6 tractor operator? You won't fully appreciate the savings until you figure in the extremely low rate of ownership depreciation, operation and maintenance of this *single* unit! Consider, too, the profitable range of Carryall Scraper hauling—to place the waste material *permanently* far enough from the pit during the normal cycle of operation, and you'll eliminate the usual rehandling costs!

. . . but Mountain State Construction carried the savings a step farther—by adding a LeTourneau Bulldozer to their regular stripping tractor. The same positive cable control that *cleans* the Carryall bowl at every dump, delivers a powerful Bulldozer action to stockpile finished aggregates, feed hoppers, pioneer roads, as the work demands . . . at no extra tractor or special tool investment. Changeover on the same Power Unit is accomplished in but 30 minutes, for the 'Dozer "A" frame remains mounted on the tractor; only the blade is dropped.

Our field engineers are ready to apply their latest cost analyses and job methods studies to your own production problems in the interests of lowering your *every* materials-handling cost. *They'll accommodate your pocketbook, too!* Ask your LeTourneau and "Caterpillar" dealer for the facts. R. G. LeTOURNEAU, INC., Peoria, Illinois, Stockton, California, Cable Address: "Bobletorno."

**LETOURNEAU**

**STRIPPING EQUIPMENT**

**CARRYALL* SCRAPERS, ANGLEDOZERS*, BULLDOZERS, ROOTERS*, POWER CONTROL UNITS, BUGGIES*, DRAG SCRAPERS, PUSHDOZERS, SHEEP'S FOOT ROLLERS, CRANES, TREEDOZERS. *Name Reg. U. S. Pat. Off.**

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# What!

# Steel

# Cheaper than Wood ?

YOU may be one of the many who think of timber as the cheapest material for building belt conveyor frames, and it was not so long ago that this was true. But now—it is hard to find a conveyor installation that would not be cheaper with the new Barber-Greene Standardized Conveyor Truss.

The B-G Truss is Pre-Engineered. You get the truss to support a given load for a given span or overhang.

It is shipped from stock—no costly delays.

It can be erected in a fraction of the time required for building a timber truss—and with less expensive labor.

Since much longer spans are possible, fewer bents are needed, not only saving the cost—but avoiding unnecessary ground obstructions.

The upkeep of a B-G Standardized Steel Truss Conveyor is much less than a wood frame. There is no sagging, rotting, or warping, and no fire hazard.

The belt life is greatly prolonged because the B-G steel frame is correctly aligned and retains this alignment.

All the idlers may be easily reached for lubrication and alignment. This is particularly important on the return belt idlers, which are very inaccessible in most timber frame construction.

The decking in timber conveyors is usually flat, allowing the material to build up and stop the idlers. Curved (self-shedding) decking is furnished with the B-G Truss.

Your Barber-Greene can never be made obsolete in your material handling system. It can be lengthened, shortened, or otherwise altered to meet changing conditions, or new set-ups. It is built to take all standard B-G conveyor parts and accessories. For the same reason, there is always a high resale value on Barber-Greenes—much greater than the small salvage value of a timber from conveyor.

A B-G representative will gladly call to discuss YOUR material handling problems. There is no obligation.

BARBER-GREENE COMPANY

492 West Park Ave. Aurora, Ill.

# FACTS

**TESTED AND PROVED**—The pioneer of minimum weight excavators, featuring the time-proved Center Drive design in turntable, crawler and shovel boom.

**BALANCED DESIGN**—Patented sloping machinery frame concentrates weight where it develops the maximum capacities at minimum weight.

**SIMPLICITY**—A compact, accessible design whose fewer parts are huskier, stronger.

**CONCENTRATED POWER**—A direct-to-the-point application of power, which can be concentrated all on one operation or spread over simultaneous operations. Gas, Diesel or electric.

**MOBILITY**—Two Crawler speeds (and steering) in either direction. 30" wide treads available for minimum ground pressures. Fast loading, single-purpose trailers for long distance moves.

**VERSATILITY**—Easily convertible, and equally efficient, as crane, dragline, clamshell, shovel, backdigger, skimmer scoop.

# AND FIGURES

**97.64 YARDS PER HOUR**—that's the average output of ¾ yd. Lorain shovels and draglines, as reported by owners on 53 different jobs in all parts of the country.

In other words, the ¾ yd. Lorain is designed for digging *more material, faster, at lower cost*—and does it! Write today for catalog describing this profit-proved ¾ yd. machine.

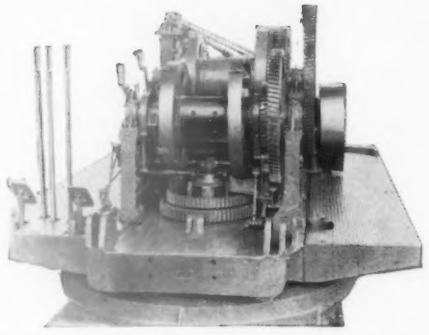
THEW CENTER DRIVE

REG U.S. PAT. OFF.

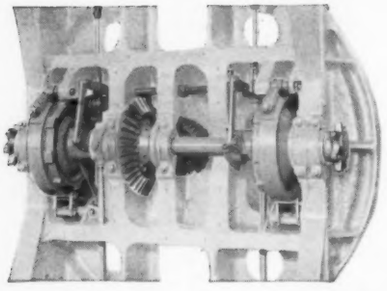
UNIVERSAL CRANE DIVISION
THE THEW SHOVEL COMPANY
LORAIN, OHIO

# ¾ YD LORAIN 40A

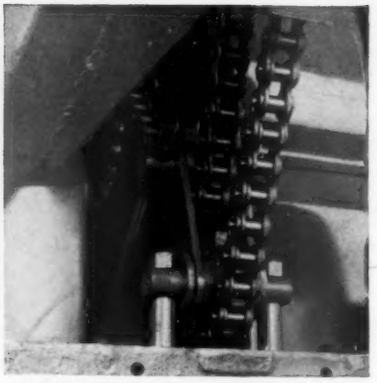
# SHOVEL FEATURES
## *like these COST NO MORE when you buy a* BAY CITY



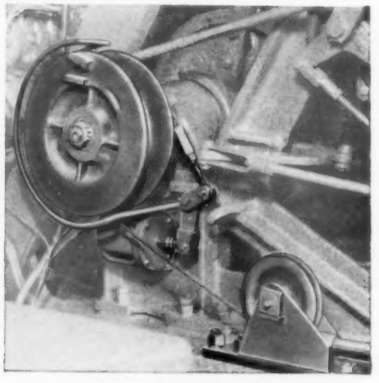
Quiet, powerful helical gears—tandem drums—anti-friction bearings throughout—3 lever control with booster operated clutches—boom foot lugs cast integral with unit-cast alloy steel revolving table—ample room around machinery and inside cab.



Working time is the only time to count in figuring yardage. Fast, easy travel and steering with BAY CITY design by simply applying pressure on cone clutches that operate brakes. ***No jaw clutches or brakes to set.*** Automatic propelling chocks hold machine while working.



All BAY CITY Shovels from ¾ yd. up are standard equipped with heavy duty single piece powerful chain crowd mechanism—independent and positive. Automatic chain adjustment maintains proper tension at any boom angle.

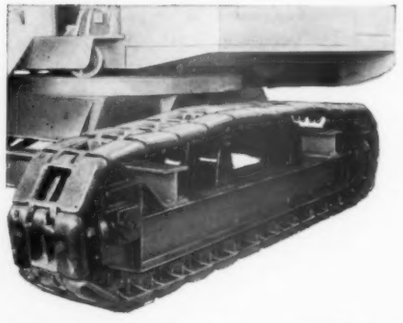


Don't criticize your operator for low production, unless he has the advantage of this exclusive Electric Dipper Trip which adds from 10 to 15% to daily yardage. Push button control on top of swing lever grip just where needed.

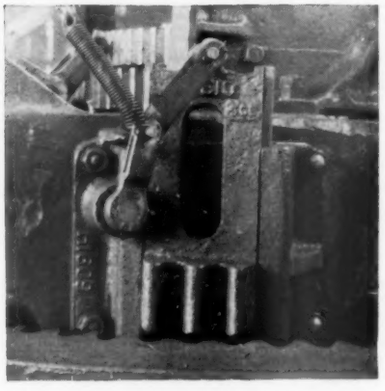
## *. . . because* they are STANDARD

So many of our new customers—former users of other machines—are so enthusiastic about the operating advantages of the BAY CITY, that we realized maybe it's our fault you do not know about the many money-making features. So for the first time in these pages, we review some of the more important features that result in lower operating and maintenance costs—bigger yardage—easier operation — faster speeds — greater power. Look them over, then write for a complete description contained in Catalog H-3.

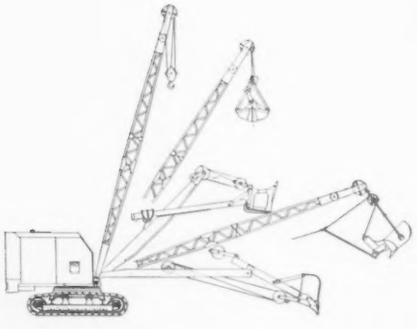
**BAY CITY SHOVELS, Inc., Bay City, Mich.**



Long, wide crawlers provide low ground bearing pressure at no extra expense and drop forged crawler shoes with drilled pin holes and alloy pins give greater wear, thus reducing one of the largest single items of shovel up-keep. Drop forged crawler rollers and special heat-treated drive sprockets, also standard.



Here is a feature that saves money—if time means money on your job. This sturdy, patented swing lock engages positively in bull gear and will hold in any position of the circle. Operated by foot lever from inside cab.



## FULLY CONVERTIBLE

All BAY CITY machines follow the same general design and are fully convertible without machinery change. Use them as shovel, crane, clam, drag or trench-hoe for bigger performance at lower operating and maintenance cost.

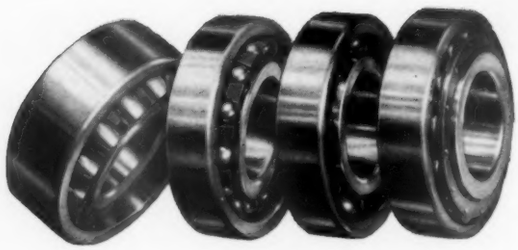
# BAY CITY SHOVELS

**ONE OWNER SAYS:** "We threw out our old transportation system to put in five Pheonix Model RP-10 trailers and were able to increase our tonnage 30%." The five Easton Pheonix Semi-Trailers on this job are hauling a combined average of over 290 tons per hour. These trailers run a half-mile round trip haul, negotiating a 3½% grade against the load. They are loaded at the halfway mark by two 3-yard shovels. Here and on other recent installations these big Easton Trailers are setting new highs in capacity, new lows in operating cost and new savings in maintenance. It all adds up to

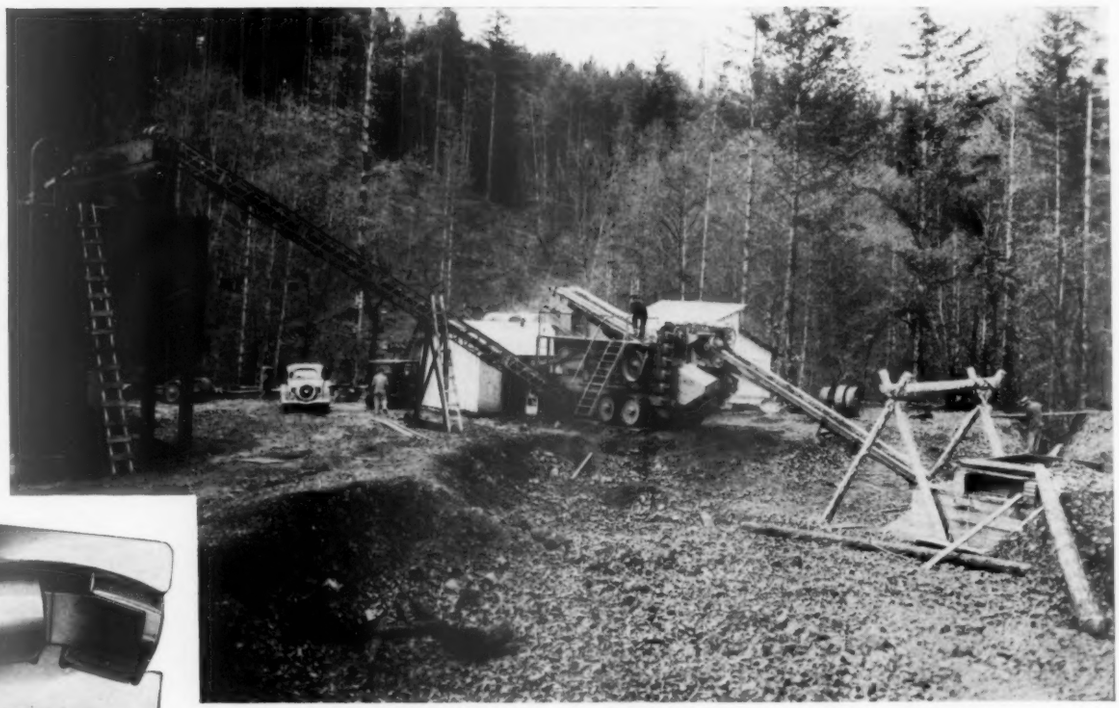
*Bigger Payloads*

**EASTON** Pheonix Semi-Trailer mounted over Mack Tractor. Capacity of trailer illustrated is 15 tons. Other capacities available to meet specific conditions. Address inquiries to Easton Car & Construction Co., Easton, Pa.

E-100



# DESIGNED FOR MACHINES THAT WORK ON THE TOUGHER JOBS



● *No. 100 Crushing and Screening Plant owned by Marion County, Oregon. Built by the Austin-Western Road Mach'y Co.*

## SKF BEARINGS TAKE PLENTY OF PUNISHMENT, BUT THEY ALWAYS COME BACK FOR MORE

● Crushing, screening and other tough jobs that the rock products industry gives to SKF-equipped machines are done easily, quickly and profitably.

That's because SKF Bearings are designed for equipment that, operating in all kinds of weather, is exposed to dust, dirt, and moisture. They're built to withstand vibration, to reduce attention to occasional lubrication, to take heavy shock loads, and come back for more.

If you have a place for a long-lived bearing that never requires adjustments . . . a high capacity bearing with the strength of Hercules . . . a carefree bearing that helps you make money by staying on the job . . . get an SKF. It's a tough job bearing.

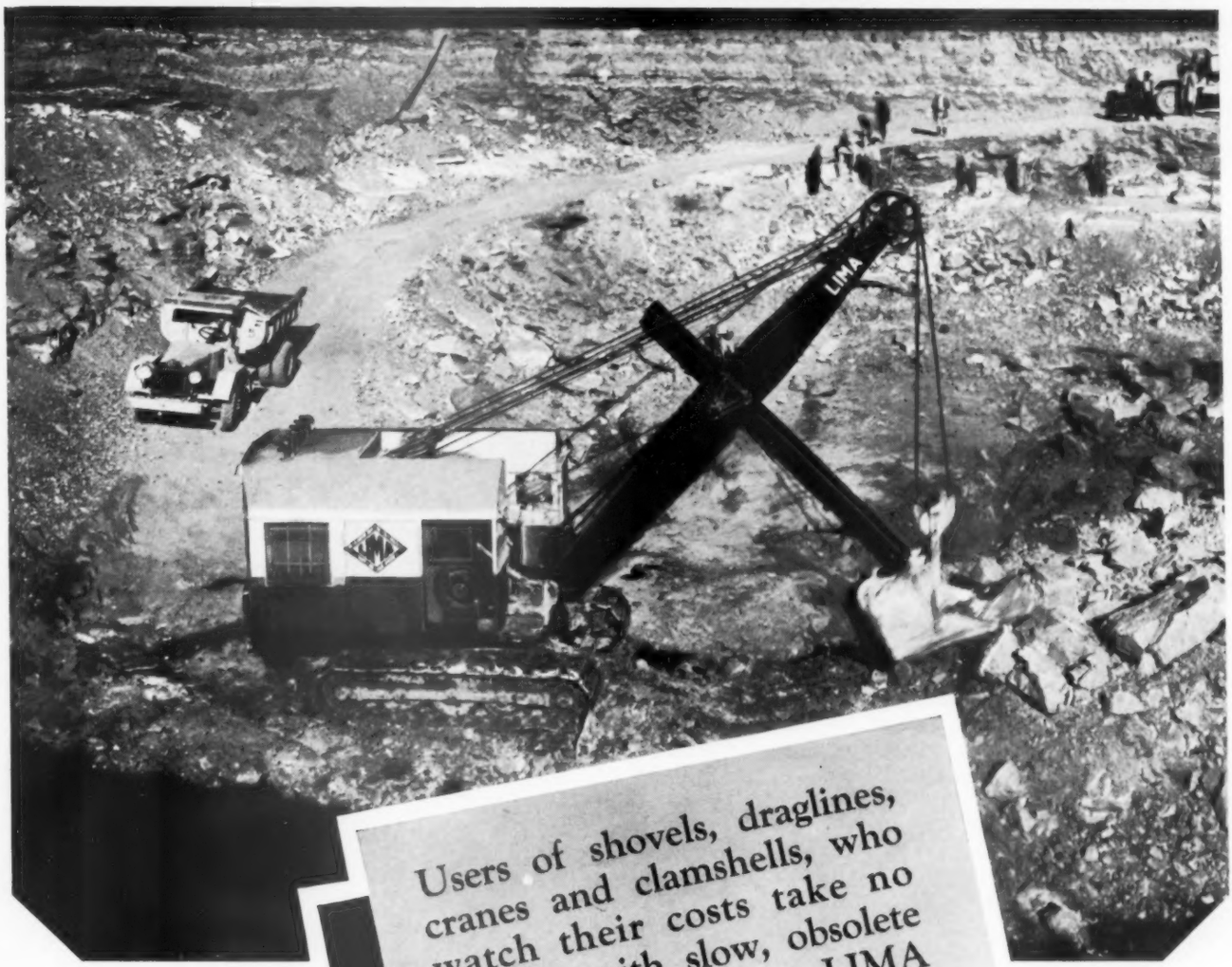
4332

**SKF**

**Ball and Roller Bearings**

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

# LIMA – IS "TOPS" in PERFORMANCE and ECONOMY




LIMA 2 Yard Shovel working at Conchas Dam, New Mexico.

Users of shovels, draglines, cranes and clamshells, who watch their costs take no chances with slow, obsolete machines. They use LIMA excavators and are getting lowest cost per yard performance. Make your next excavator a LIMA and get more value for your money.

LIMA LOCOMOTIVE WORKS, INC.
SHOVEL and CRANE DIVISION
LIMA, OHIO, U. S. A.

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LIMA

SHOVELS -- DRAGLINES -- CRANES -- CLAMSHELLS

# ONE DAY'S WORK FOR COTTRELLS

## Collecting

Cottrell Collecting Cement Dust

1. 120 tons of fly ash at a power plant.
2. 6 tons of soda salts at a paper mill.
3. 55 tons of smelter dust containing 20 percent copper.
4. 13 tons of sodium sulphate at 92 per-cent content.
5. 3 tons of antimony dust from a silver refinery.
6. 208 tons of 12 percent copper dust.
7. 1100 pounds of mercury dust.
8. 10 tons of arsenic.
9. 3 tons of tar at a gas plant.
10. 12,000 pounds of blast furnace dust fine cleaning.
11. 4½ tons of alumina.
12. 5500 pounds of concentrated sulphuric acid.
13. 22 tons of cement dust.
14. 20 tons of roaster dust.

These DAILY savings of values soon pay for Cottrell installations. You can get similar benefits in the collection of any kind of dust, fog, fume or mist or any kind of dust nuisance elimination.

**Write for Bulletins**

**WESTERN PRECIPITATION CORPORATION**
1016 W. 9th ST., LOS ANGELES, CALIF.
405 LEXINGTON AVE., NEW YORK, N. Y.

**RESEARCH CORPORATION**
405 LEXINGTON AVE., NEW YORK, N. Y.
59 E. VAN BUREN ST., CHICAGO, ILL.

**PIONEERS IN DUST AND FUME CONTROL**

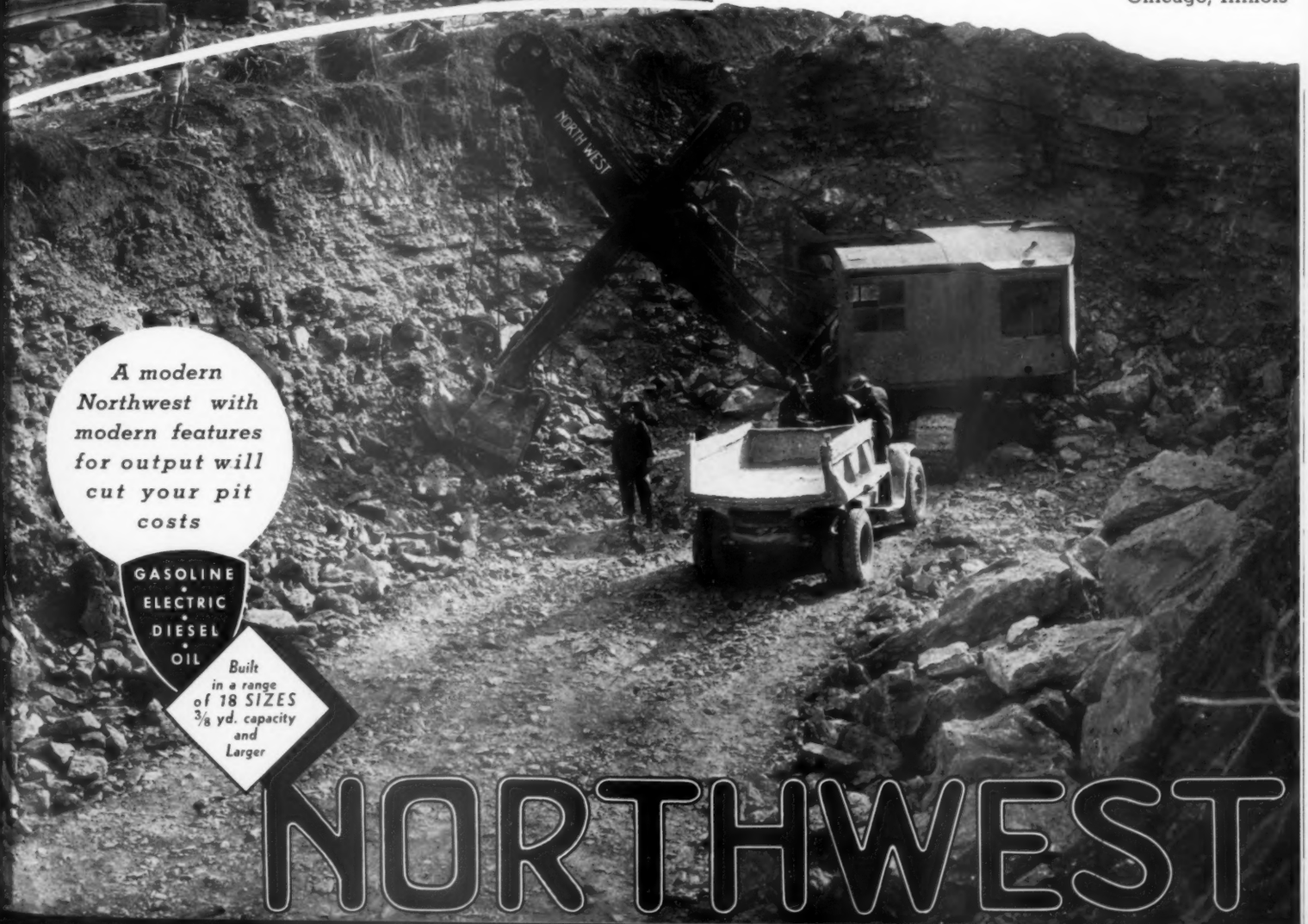
# BURNING MONEY!

THIRTY years old and still working! A grand old testimonial to the quality that our forefathers built into machinery—but a clattering, spark-spitting testimonial to inefficiency and costly operation. Every time it's stoked up it's like shoveling money into the fire.

Operators that continue production with relics like this because it owes them nothing on the original investment are kidding themselves. Today a 3/4 yd. Northwest that can swing in the length of that old cab can equal its output without the cost that comes with coal, banking fires, getting up steam, pumping and piping water, to say nothing of all the other troubles like moving delays, packing troubles, water troubles, boiler tube troubles and the cost of baling wire to hold it together.

You can cut your costs with a modern Northwest Shovel. Ask for details.

NORTHWEST ENGINEERING CO.
1822 Steger Building, 28 East Jackson Boulevard
Chicago, Illinois

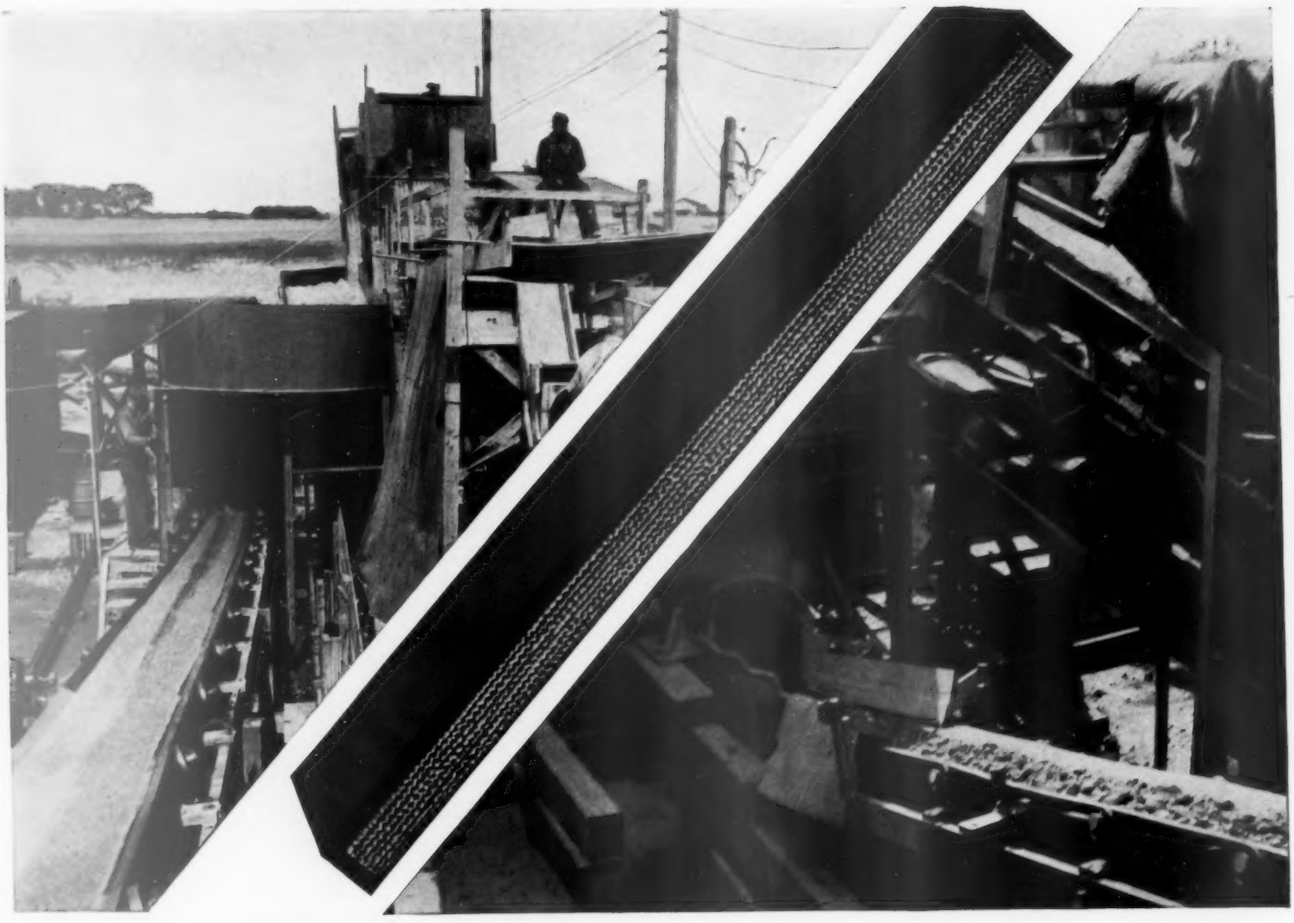



*A modern Northwest with modern features for output will cut your pit costs*

GASOLINE • ELECTRIC • DIESEL • OIL

*Built in a range of 18 SIZES 3/8 yd. capacity and Larger*

NORTHWEST



# QUAKER
# CONVEYOR BELT

This modern sand and gravel plant in the Central West uses Quaker Conveyor Belts . . . they can't afford to have production stopped or curtailed through belt failures.

In the operation of this plant, both dewatered sand and ½" to 1" gravel are conveyed. Quaker belts permit economical operation.

Quaker conveyor belts are specifically made to deliver tonnage right where the belt is being used . . . custom-made to fit the exact working conditions.

If you are conveying sand, gravel, crushed stone, cement, rock or kindred material, get in touch with Quaker . . . we can help you with your belt problems.

*Quaker's experienced engineers and belt experts are available on any belt problem. They can help you. Give us a call.*

BELTING
HOSE
PACKINGS

If it's a QUAKER Product, it's Guaranteed

## QUAKER CITY RUBBER COMPANY

OVER 50 YEARS OF CONSISTENT QUALITY

PHILADELPHIA · NEW YORK · CHICAGO · SAN FRANCISCO

# Over 25 MILLION ATLAS MANASITE DETONATORS

have been used in the brief space of time since their introduction

*Another* "ATLAS FIRST" *for* GREATER SAFETY

Have men responsible for safety in blasting operations welcomed the new Atlas Manasite Detonators? *Yes!* Purchases of over 25 million detonators answer this question.

Atlas Manasite Detonators make safety precautions more effective by lessening the possibility of accident from inadvertent mishandling.

Through an exclusive method of using hexanitromannite as an initiating compound, Atlas Manasite Detonators offer materially decreased sensitivity to impact and friction—with no loss in detonating efficiency—and no increase in price!

Ask your Atlas Representative for full details.

**ATLAS MANASITE**

BLASTING CAPS, ELECTRIC BLASTING CAPS, DELAY ELECTRIC BLASTING CAPS

## ATLAS POWDER COMPANY, WILMINGTON, DEL.

Cable Address—Atpowco

*Everything for Blasting*

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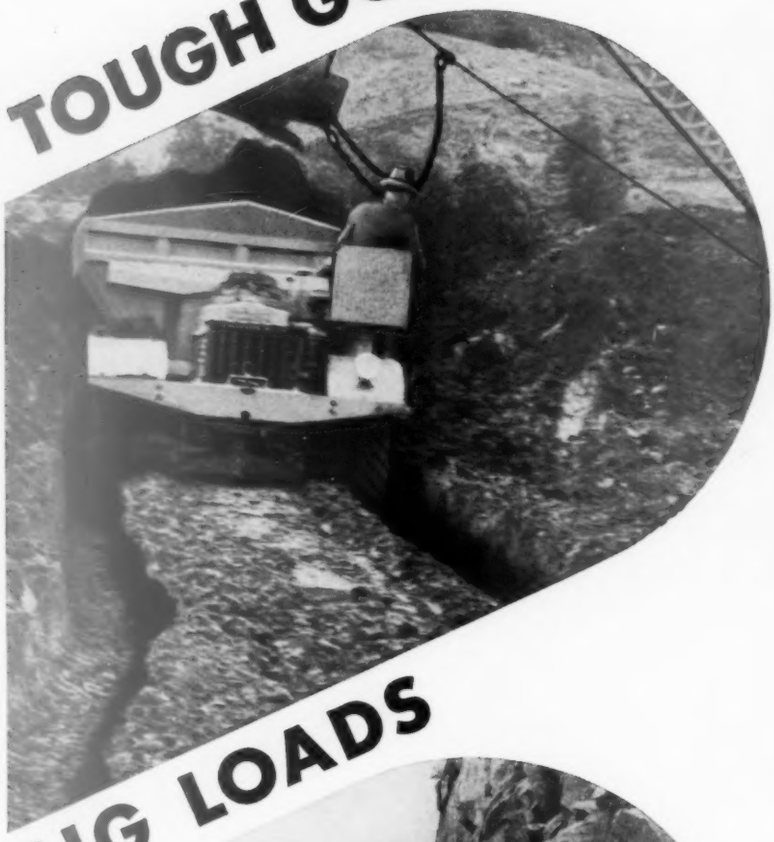
# ATLAS

EXPLOSIVES

CHEMICALS ATLAS EXPLOSIVES

# KOEHRING

## TOUGH GOING



## BIG LOADS

***Tough going*** **in sand or mud—with big, heavy loads —is an easy job for Koehring Dumptors—because of the extra-size 4 inch chrome nickel axles. No job delays due to broken axles. Husky one piece alloy steel axle housing further assures freedom from breakage of this most important operating function. Compare this construction with other hauling units.**

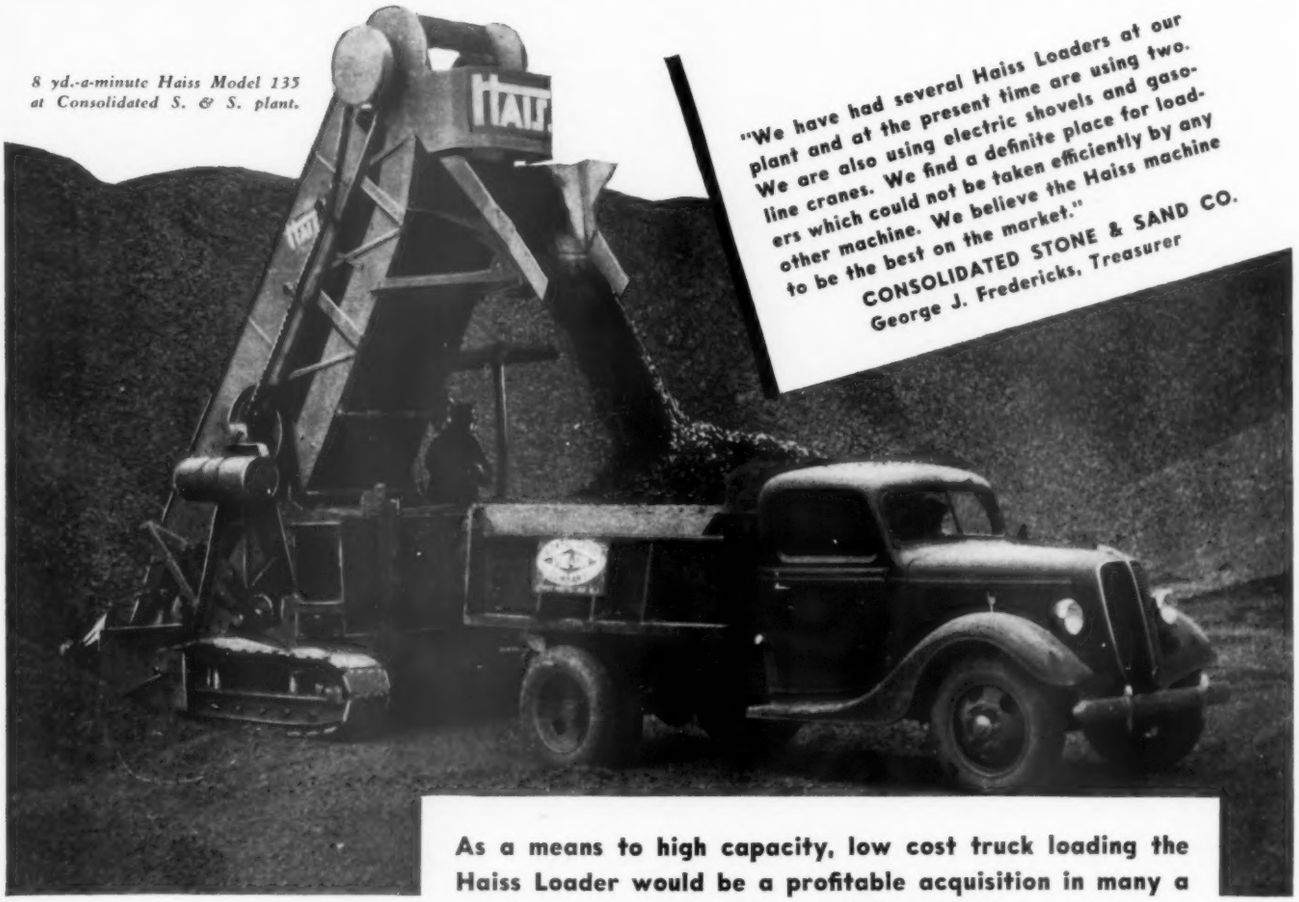
**KOEHRING COMPANY**
*Heavy-Duty Construction Equipment*
MILWAUKEE • WISCONSIN

KOEHRING HEAVY DUTY

## ★ ★ Require HUSKY AXLES

**Husky 4 inch chrome nickel axles with large tapered bearings — all enclosed in one piece alloy steel housing — especially designed for *tough hauling* service.**

# Where ECONOMY Prevails




*8 yd.-a-minute Haiss Model 135 at Consolidated S. & S. plant.*

**"We have had several Haiss Loaders at our plant and at the present time are using two. We are also using electric shovels and gasoline cranes. We find a definite place for loaders which could not be taken efficiently by any other machine. We believe the Haiss machine to be the best on the market."**

**CONSOLIDATED STONE & SAND CO.**
**George J. Fredericks, *Treasurer***

**As a means to high capacity, low cost truck loading the Haiss Loader would be a profitable acquisition in many a plant not now using loaders. We do not ask you to take our word for it, but we would like to put in your hands a series of cost study tables on various methods of handling which will help you to work out an answer in terms of your own plant and conditions. Are you willing to figure out what a 5 or 8 yard Loader would do to your loading costs, today?**

## *4 Great Haiss Loaders*

**FOR HEAVY DUTY**

**MODEL "135"**
with a capacity of 5 to 8 yards a minute.

**MODEL "80"**
The second big machine, 3 to 5 yds. a minute.

**MODEL "27"**
The general purpose Loader with a 2 to 3 yd. capacity and weight and power for heavy digging.

**FOR STOCKPILES**

**MODEL "75"**
The Stockpile Loader with 3 yd. capacity, at a popular price.

*Write for "1939 Cost Studies," or clip the coupon and pin it to a letterhead.*

**HAISS**

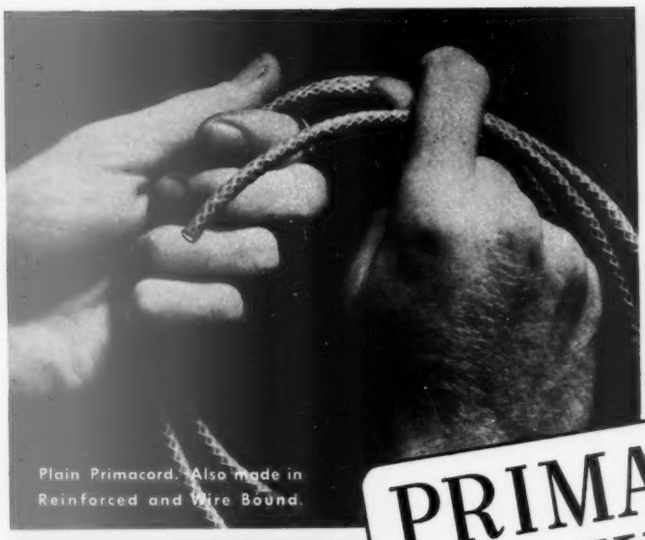
**LOADERS**
**EXCAVATORS**
**CONVEYORS**
**BUCKETS**

**GEORGE HAISS MANUFACTURING CO., INC.**
**142nd Street & Rider Avenue, New York, N. Y.**

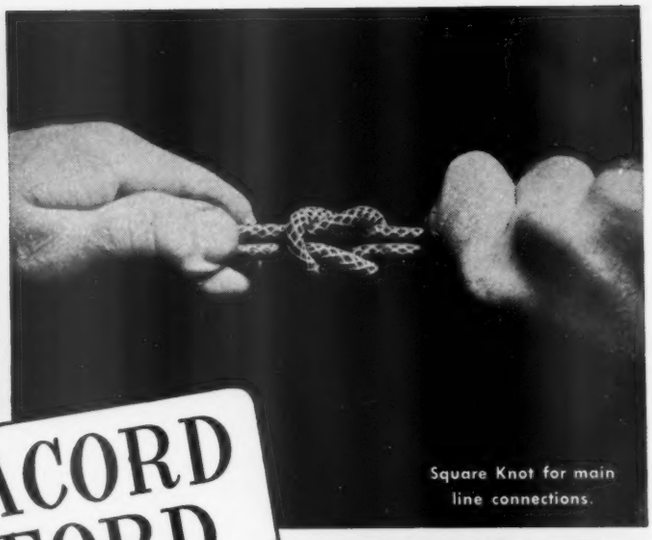
Please send me your Cost Studies and data, with particular reference to a Loader of approximately .....yd. capacity.

NAME .....

ADDRESS .....

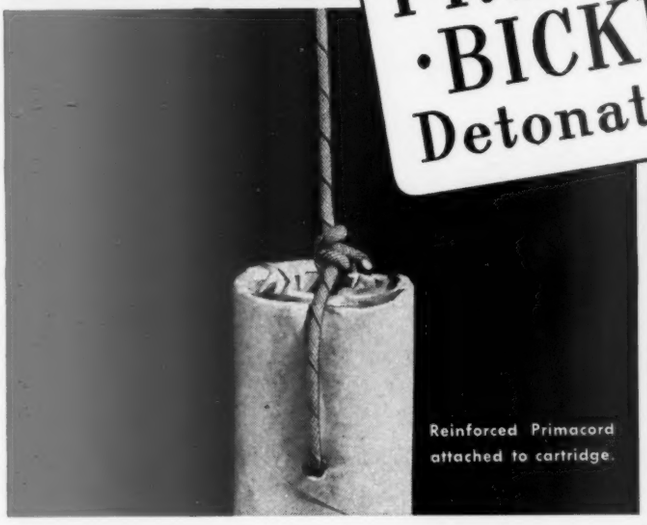


Plain Primacord. Also made in Reinforced and Wire Bound.



Square Knot for main line connections.

# PRIMACORD ·BICKFORD Detonating Fuse



Reinforced Primacord attached to cartridge.

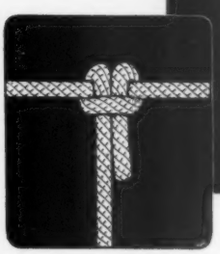
Half Hitch used in connecting branch line to main line.

## PENTAERYTHRITETETRANITRATE* —hard to pronounce but easy to use

Primacord has broadened the use of detonating fuse. Because of its special textile covering—light, flexible, waterproof, strong—it is very easy to use. No special tools are required. Because of its core of *PETN it detonates along its entire length at a speed of 3.9 miles per second. This speed is practically instantaneous, yet permits shots planned to relieve burden, resulting in better fragmentation—more useful work from the explosive charges.

Full details are contained in the Primacord Booklet — free upon request. THE ENSIGN-BICKFORD COMPANY, Simsbury, Conn. Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse Since 1836.

Attaching fuse and cap to main line Primacord.



PB-8

# PRIMACORD·BICKFORD *Detonating Fuse*

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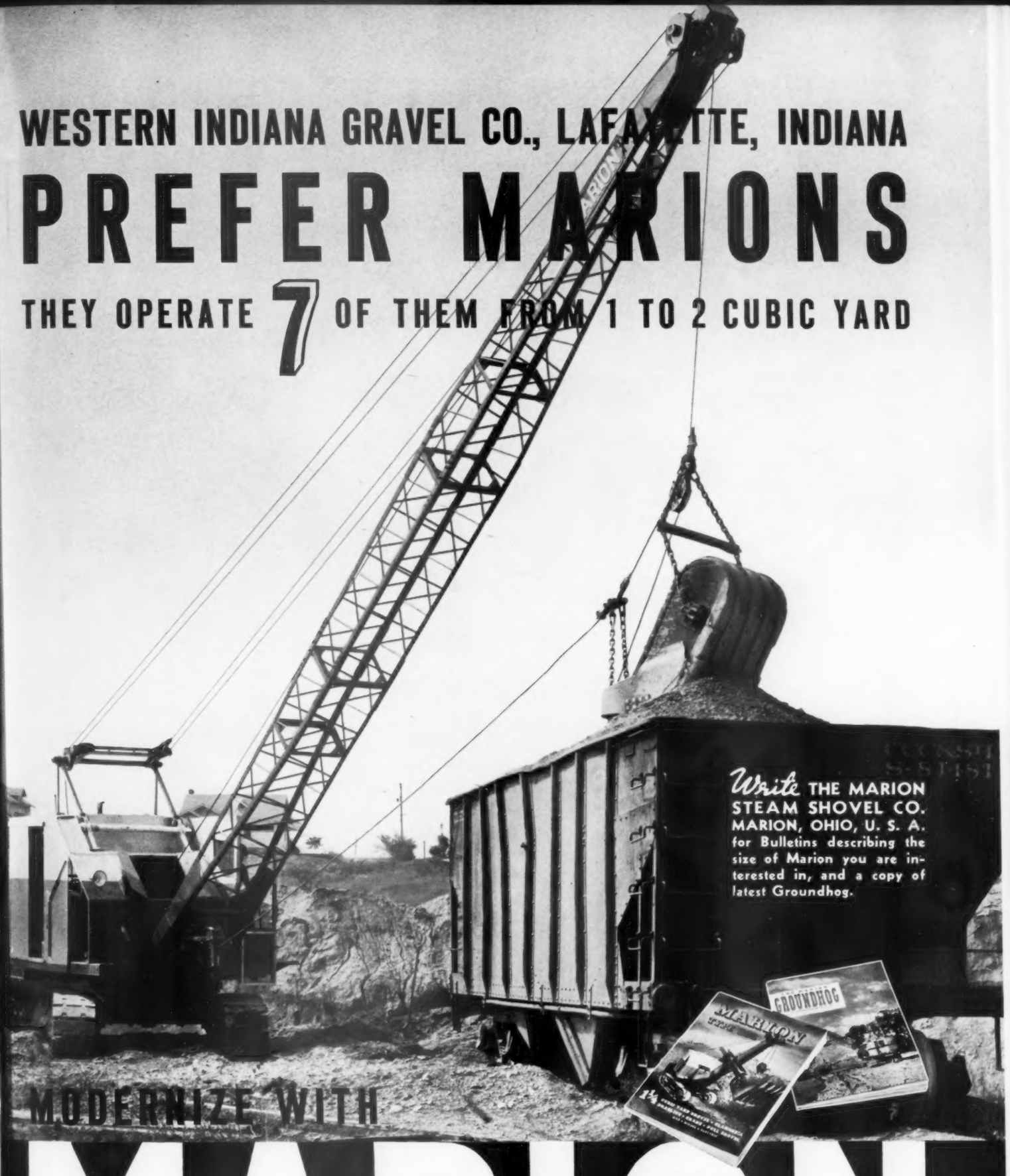
# PREFER MARIONS

THEY OPERATE 7 OF THEM FROM 1 TO 2 CUBIC YARD

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FROM THE DAILY REPORT OF A
TIGER BRAND WIRE ROPE ENGINEER

They sure do things in a big way here at this mine. Some of the biggest shovels I've ever seen. I can't help wondering what would happen if the wire rope should fail. Cost them thousands of dollars, I'll bet!

The super tells me he's not wasting any time worrying about troubles. And after inspecting the rope, I say he's right. This particular shovel has been working steady for several months since it was last roped with American Tiger Brand, and the rope is still in perfect condition.

Yours,

*Al*

*P.S. Here's a photo of me in the giant shovel. Boy! am I glad the rope holding me up is American Tiger Brand.*

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TURN your wire rope questions over to an American Tiger Brand Wire Rope Engineer. He lives and breathes wire rope, spends most of his time seeing it in action, checking its performance, studying ways and means of saving you money.

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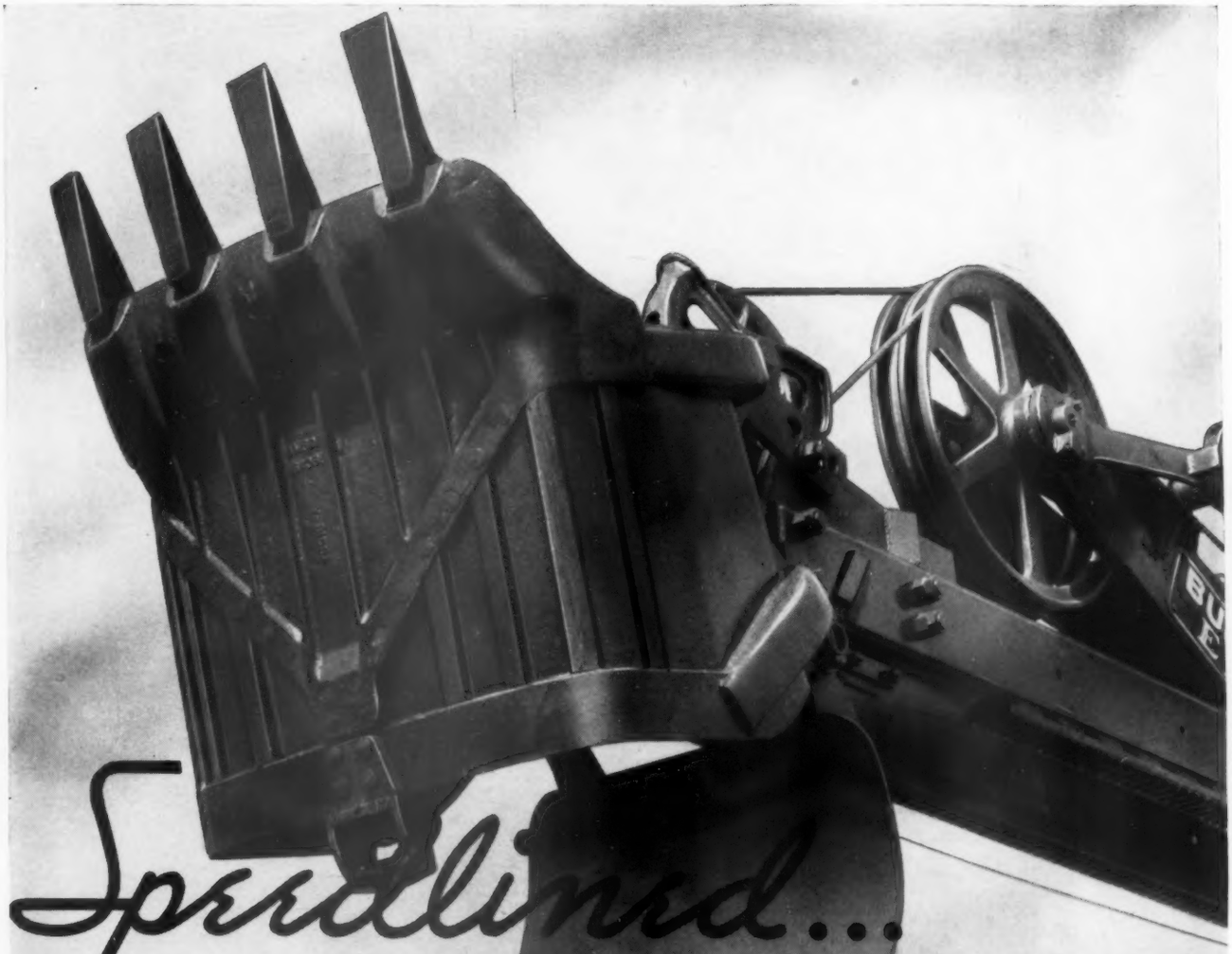

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BUCYRUS ERIE

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The Knoxville Sangravl Company's experience is a concrete example of the profits a fixed plant producer can secure from portable plant operation.

High output and low maintenance are assured, for the deep jaws, operating at unusually high speeds on oversize shafts and oversize bearings are so carefully designed and well made that, size for size, they outperform and outlast all other jaw crushers in fixed or portable plants. The screens, conveyers, etc., are ruggedly built and designed to put out aggregate at top speed, no bottle necks to choke production.

Readily portable on pneumatic tires, there is a portable plant to meet any capacity you require. Ask us to send you details on profits from portable plant operation.

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**ROAD MACHINERY CO., Aurora, Illinois**

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6-Yard Tractor-Scraper
8-Yard Tractor Scraper
12-Yard Hydraulic Scraper

PIT AND QUARRY

Vol. 31 May, 1939 No. 11

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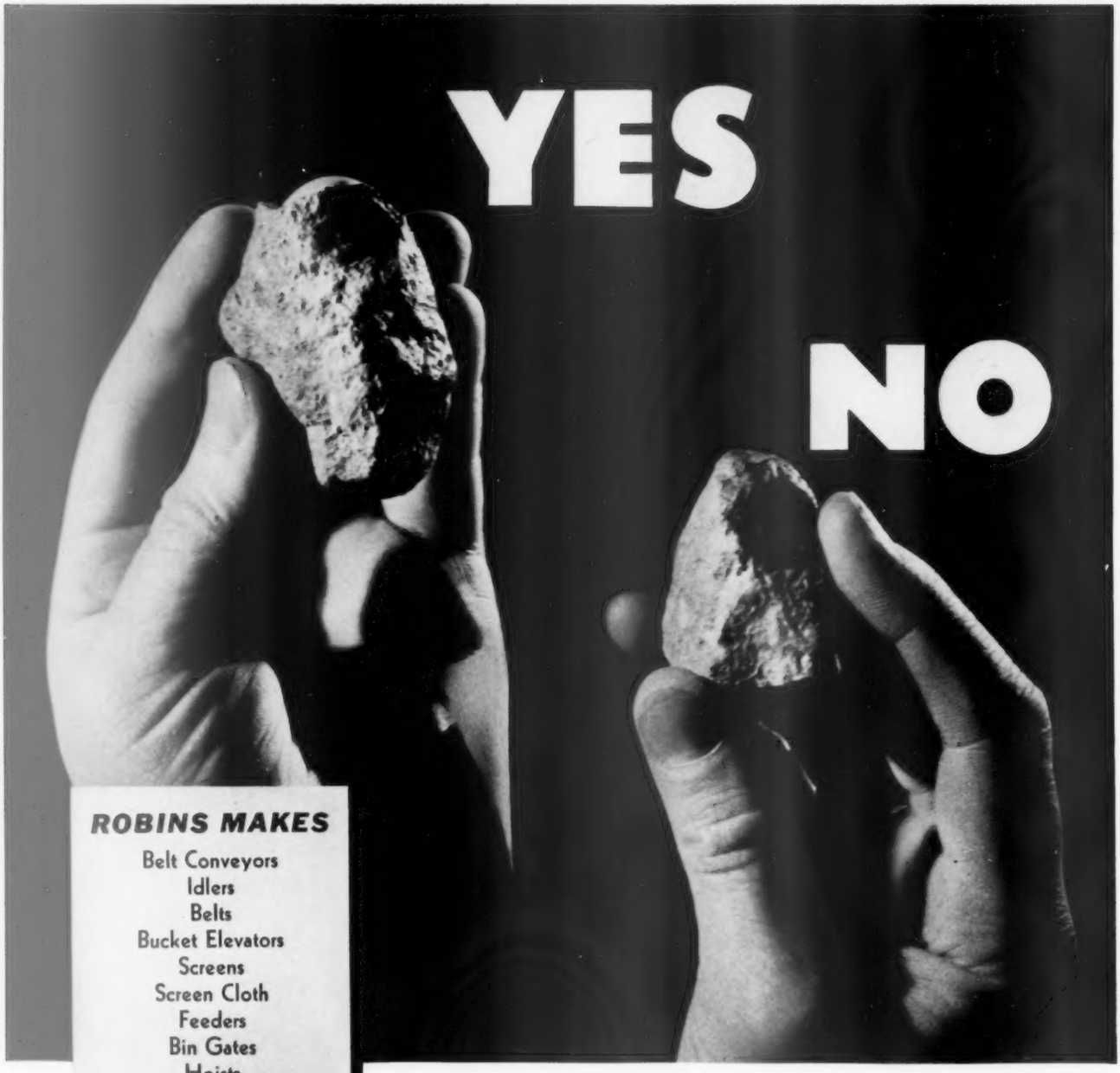


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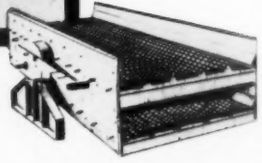

A difference in size that state inspector can't see he'll find with his "yes" and "no" gauges. You can do it and give him the specified size with Robins GYREX, VIBREX and ELIPTEX Screens. Robins Screens are fast, efficient and use but little power.

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MATERIAL HANDLING ROBINS EQUIPMENT

## U. S. Invites Bids on 5,800,000 Bbl.

**LARGEST CEMENT ORDER SEEN**

Bids for what may be the largest order of cement ever placed in the United States have been invited by the Federal Treasury department for Shasta Dam in California.

The Federal Bureau of Reclamation has announced that bids would be opened May 1, in Washington, D. C., for supplying low-heat Portland cement in various bulk quantities up to a maximum of 5,800,000 bbl. for use in the construction of the dam.

One schedule, for 5,800,000 bbl. covers the estimated total quantity to be required for the completion of the dam. Another schedule covers the estimated maximum quantity to be required, for delivery at a uniform rate of 100,000 bbl. a month.

If the first schedule is adopted, it would be the largest single cement order ever placed.

Approximately $10,000,000 worth of cement will be used in Shasta dam. The first concrete is expected to be poured in March, 1940.

## North American Cement Acquires 500 Acres

The North American Cement Corp. has acquired approximately 500 acres of land adjoining its plant and quarry at Alsen, N. Y.

The land contains limestone deposits which will be utilized for quarry purposes in the future.

## New Rock-Asphalt Firm Chartered in Kentucky

A $500,000 firm, the Tar Rock Co., has been chartered in Kentucky to operate at Bowling Green. Incorporators include Garland D. Sledge, Bowling Green banker, John T. Adams of New York, N. Y., Coleman Taylor of Amsterdam, N. Y., and J. F. Eggleston of Franklin, Tenn.

The new concern has taken over the properties of the defunct United Rock Asphalt Co. and Diamond Rock Asphalt Co., including a 16,000-acre long-term lease on asphalt deposits in Edmonson County.

## Yosemite to Spend $100,000 on Plant

Contracts have been awarded by the Yosemite Portland Cement Co. for improvements to its plant at Merced, Cal., to cost in the neighborhood of $100,000.

Work, which is now in progress, includes the relining and resetting of one of the two rotary kilns, installing new separators and dust-collectors in the finishing mill. At the quarry new cables are being laid, a new crusher installed, and a weigh-batcher is being placed in service.

## Coming Events

*May 15, 16, 17, 1939 — New York, N. Y.* Spring meeting, Portland Cement Assn., Waldorf-Astoria Hotel.

*May 24, 25, 26, 1939—Atlantic City, N. J.* Fourth annual convention, National Industrial Sand Assn., Ambassador Hotel.

*June 1, 2, 1939—Hot Springs, Va.* Twenty-first annual convention, National Lime Assn., Homestead Hotel.

*July 20, 1939 — Rye, N. Y.* Mid-summer meeting, Board of Directors, National Crushed Stone Assn., Westchester Country Club.

*July 27 and 28, 1939 — San Francisco, Cal.* Mid-summer meeting, Board of Directors, National Sand & Gravel Assn., Palace Hotel.

*October 16-20, 1939 — Atlantic City, N. J.* National Safety Congress and Exposition.

## Eugene Switzer, 63, Dies at Petoskey

**WITH CEMENT FIRM 19 YEARS**

Eugene C. Switzer, 63, general superintendent of the Petoskey Portland Cement Co., Petoskey, Mich., died April 2 following a brief illness of influenza and pneumonia.

Mr. Switzer went to Petoskey in 1920 as construction superintendent for the newly-formed Petoskey Portland Cement Co. in charge of the building of the plant and remained as general superintendent. He was elected a member of the Petoskey city council in 1924 and served the city for eight years.

Before joining the Petoskey company he was superintendent for the Wabash Portland Cement Co., Stroh, Ind.; for 13 years construction and mining engineer for the Superior Portland Cement Co.; construction engineer for the Newcastle Portland Cement Co.; construction engineer for the Carnegie Steel Co., New Castle, Pa.; mining engineer for the Shawmut Mining Co.; and civil engineer for the Shawmut & Northern Railway.

Mr. Switzer was a native of Bath, N. Y., and was graduated from Bucknell University in 1900. Besides his widow he leaves nine children. Burial took place in Kendallville, Ind., on Wednesday, April 5.

## Second-Quarter Rise in Shipments Seen

Second-quarter shipments of pit-and-quarry materials and products will be considerably higher than they were in the April-May-June period of 1938 according to reliable forecasts of the Regional Shippers' Advisory Boards.

The boards look for a rise of 9.8 per cent. in cement shipments over the railroads, a 5 per cent. increase in sand, gravel and crushed stone carloadings, a 14.4 per cent. rise in lime and plaster shipments, and a 14.8-per cent. increase for brick and clay products.

## Indiana's Aggregates Producers Gather

**PURDUM RENAMED PRESIDENT**

The annual meeting of the Indiana Mineral Aggregates Assn. was held March 30 at Indianapolis, Ind. A feature of the gathering was the presence of all the members of the Indiana Highway Commission and several of its engineers who discussed the various technical and practical problems involving road-building materials and the proposed program for Indiana's highway system in the immediate future.

Executive Secretary S. C. Hadden reviewed the legislative developments of the recent session of the Indiana legislature, pointing out that comparatively few bills of even indirect interest to the aggregates industry were enacted into law. Failure to do something about the diversion of license-fee and gasoline-tax funds was most disconcerting, he said.

Officers were reëlected as follows: President, Charles H. Purdum; Vice-presidents, C. D. Ward and Edw. F. Healey; Secretary-Treasurer, Louis F. Hart.

Three directors were elected for 2-yr. terms as follows: Ray J. Kiley, representing sand and gravel in the 1st district; C. C. Deal, representing sand and gravel in the 2nd district; and Harry Meshberger, representing crushed stone in the 2nd district. Claude Herriman was elected a director of the 3rd district representing crushed stone, for a one-year term to complete the unexpired term of Mr. Appleby. The following directors, elected in 1938 for 2-yr. terms, each has a year yet to serve: George H. Balfe, 1st district, crushed stone; M. A. Neville, 3rd district, sand and gravel; C. Gray, 4th district, sand and gravel; N. E. Kelb, 4th district, crushed stone; J. W. Bedford, 5th district, sand and gravel; and R. W. Meisinger, 5th district, crushed stone.

Offices of the association are maintained in the Occidental Bldg., Indianapolis.

## Award Cement Contracts for Mahoning Dam

Contracts for more than $600,000 worth of cement for the Mahoning Dam on the Allegheny River near Dayton, Pa., have been forwarded to the division engineer at Cincinnati for approval.

Awards of approximately 100,000 bbl. each have been made to the Standard Portland Cement Co. of Cleveland, O.; Diamond Portland Cement Co., of Middle Branch, O., and Bessemer Limestone and Cement Co., of Youngstown, O. Each contract averages $200,000.

The Dravo Corp., of Pittsburgh is building the Mahoning Dam, a link in the flood-control projects of the upper Ohio River.

## Asphalt Institute Opens Washington, D. C., Office

More fully to maintain contact with engineering and research developments at Washington, D. C., particularly in the field of highways, airports and flood control, the Asphalt Institute, with headquarters in New York, has established a district engineering office in the Transportation Bldg., at the capital.

Major Walter R. Macatee, district engineer at Cincinnati, O., has been promoted to the post at Washington. Major Macatee has recently conducted surveys and published papers on the two important subjects of airports and soil stabilization,—two subjects which are now of paramount interest at Washington as at state capitals.

## New Bituminizing Plant at Johnstown, Pa.

The $40,000 aggregate-bituminizing plant of the Pennac Asphalt Products Co. at Johnstown, Pa., is expected to be ready to start production about the middle of May. Elvin W. Overdorff is president of the concern which will manufacture both hot- and cold-type paving mixtures.

The plant, located on the Conemaugh River, includes in its equipment four 8,000-gal. steel storage tanks, a 5,000-gal. pre-heating plant, pump room, mixing tower, crushed-stone hopper, drier, feeder bins, and a brick scale-house and office building.

## Opens New Quarry in Oregon for Road Jobs

Preparations are rapidly being completed for the opening of extensive operations at South Bend, Ore., by the Willapa Harbor Quarries. The plant will soon start producing on an order for 18,000 cu.yd. of crushed stone to be used for highway resurfacing.

## Begins Production of Ready-Mixed Concrete

Concrete is now being mixed and delivered from the new ready-mixed-concrete plant recently established at the Findlay, O., quarry of the National Lime & Stone Co.

## Universal Atlas to Build Packing Plant

**MOVES OFFICES TO NEW YORK**

The Universal Atlas Cement Co. is reported to have awarded contracts for the erection of a $100,000 storage packing and distributing plant at the Lake Michigan port of Muskegon, Mich.

Storage facilities will consist of five reinforced concrete silos 24 ft. in diameter and 70 ft. high with a capacity of about 30,000 bbl. of cement. Cement will be shipped by self-unloading motorship from the company's Buffington, Ind., plant located on the lower tip of Lake Michigan.

Headquarters of the Universal Atlas concern, located in Chicago for years, are being moved to New York.

## Witt Joins Marquette as Technical Advisor

The Marquette Cement Manufacturing Co. announces the appointment of J. C. Witt as technical service manager, with headquarters in the Marquette Bldg., 140 S. Dearborn St., Chicago, Ill. His activities include the correlation of all the technical work of the company.

Mr. Witt is an engineer (M. E.), and holds a Ph.D. degree in chemistry and physics. For a number of years he has specialized in the manufacture and use of cements and other materials of construction, having been at various times chemical engineer, plant superintendent, director of research, and consultant. He is a member of the American Society of Mechanical Engineers, the American Institute of Chemical Engineers and many other technical organizations.

## New Lincoln Gravel Plant in Operation

The new plant of the Lincoln Sand & Gravel Co., Lincoln, Ill., which has been under construction since last August, has gone into operation. A novel dewatering system for sand and a flexible finished-storage system are features of the operation.

The design and construction of the new plant were in charge of Herman Clouse, superintendent.

Early spring flood waters caused considerable damage to the plant and quarry operated by Meshberger Bros. near Berne, Ind., recently.

A 10-ft. dike constructed to keep the water out weakened and collapsed, inundating the operations. Pumps are at work now dewatering the workings.

## Producers Meet for Minimum-Wage Parley

**GATHER AT WASHINGTON, D. C.**

In response to an invitation by L. Metcalf Walling, administrator of the Walsh-Healey Public Contracts Act a group of crushed stone, sand, gravel and slag producers and representatives of their respective associations and of labor groups met April 12 at a panel conference at the offices of the U. S. Dept. of Labor in Washington, D. C. This conference was held for preliminary discussion of the determination of prevailing minimum wages in these industries under this Act.

In announcing this conference Mr. Walling stated that the Department is contemplating a statistical survey of the wages now being paid in these industries. After this survey has been completed there will be a public hearing before the Public Contracts Board of the Department of Labor at which time all interested parties will have an opportunity to present their views as to the proper wage determinations which should be made for these and related industries.

A preliminary conference of industry representatives was held the evening of April 11, at which the definition of the industries and other subjects related to the next day's Conference were discussed. At the Panel Conference Mr. Walling explained the Act and the procedure followed by the Department of Labor in determining prevailing minimum wages for industries; that consideration was given to the grouping of industries in their determination and the definition to be followed; that discussion was had of a questionnaire which our industries could use in reporting prevailing wage practices; and that it was agreed that the respective national associations should submit to their executive committees, as well as to those members of the panel who are not members of the executive committees, the definition which the Department recommends and the questionnaire which the Department recommends, inviting consideration of these two documents and requesting suggestions in the interest of further negotiations with the Department of Labor.

On April 14 representatives of the crushed stone, sand and gravel and slag associations met with Mr. Walling for the purpose of discussing in more detail the proposed definition and questionnaire.

In an earlier letter to members of the Natl. Sand and Gravel Assn. Secretary V. P. Ahearn stated that "until there is a formal finding by the Secretary of Labor regarding prevailing minimum wages in the sand and gravel industry, under the Walsh-Healy Act, that part of the Act is inoperative so far as our industry is concerned . . . the Act affects only contracts whose value exceeds $10,000 and where there is a direct contractual relationship between the producing company and an agency of the Federal Government. With the exception of minimum wages, other parts of the Act, including limitations on daily and weekly employment and the payment of overtime for hours worked in excess of such daily and weekly maximums, are in effect."

## Ash Grove Opens Plant on Part-Time Basis

The Ash Grove Lime & Portland Cement Co. plant at Chanute, Kan., was reopened last month on a part-capacity basis. It had been closed since February.

Supt. Guy O. Gardner disclosed that the length of time the plant would continue operations was indefinite.

## Concrete-Truck Drivers Lose Appeal in Ohio

An appeal of the Truck Drivers Local No. 413 from the decision of Judge Dana F. Reynolds preventing union interference with the Anderson Haulage Co., truckers of ready-mixed cement, Columbus, O., was dismissed in the Court of Appeals.

The dismissal was on legal grounds, namely that "the notice of appeal did not designate the order, judgment or decree appealed from."

## U. S. Spends Millions for Job Materials

**2-YEAR FIGURES RELEASED**

The table which appears on this page listing recent government awards under the Walsh-Healey Act has been a regular feature for several months and is compiled from weekly reports issued from Washington, D. C.

In this connection it is interesting to note some figures covering the 2-yr. period Sept. 28, 1936 to Sept. 29, 1938 which have just been released. A total of $16,004,783.59 worth of contracts were awarded by the government during this period for aggregates, etc., divided among the various materials as follows:

| | |
|---|---|
| Crushed stone | $5,664,569.42 |
| Sand and gravel | 7,436,813.46 |
| Slag | 1,004,063.37 |
| Riprap | 598,379.70 |
| Soil and earths | 1,230,642.64 |
| Oyster shells | 70,315.00 |

## Iowa Plant Arranges to Buy Municipal Power

The Bellevue Sand & Gravel Co., Bellevue, Ia., which has been purchasing public-utility power has made arrangements to obtain its requirements from the Bellevue municipal light and power plant. The power plant has just installed a new 450-hp. Diesel engine and has sufficient surplus energy to care for the gravel company's needs.

**RECENT GOVERNMENT CONTRACTS FOR MATERIALS UNDER THE PUBLIC CONTRACTS (WALSH-HEALEY) ACT**

| Date of Delivery 1939 | Source of Supply | Government Agency | Commodity | Amount |
|---|---|---|---|---|
| 4/28 | Whitehall Cement Mfg. Co., Cementon, Pa. | WPA, Treas., Proc. | Portland cement | $11,010.00 |
| 3/3 | Southwestern Portland Cement Co., El Paso, Tex. | War, QMC | Portland cement | 11,250.00 |
| 4/18 | Cummer Lime & Mfg. Co., Ocala, Fla. | WPA, Treas., Proc. | Concrete blocks | 12,518.50 |
| 12/31 | Maymead Lime Co., Shouns, Tenn. | Agriculture | Agricultural lime | Indefinite |
| 9/30 | Mike Malfitano & Son, Pittsburg, Cal. | War, Engineers | Gravel | 53,410.00 |
| 6/30 | Colonial Sand & Stone Co., Inc., New York, N. Y. | WPA, Treas., Proc. | Sand | 20,572.00 |
| Indef. | Craven-Lang Co., New Orleans, La. | WPA, Treas., Proc. | Mixed rock asphalt | 40,432.00 |
| 4/2 | Sensibar Eng. & Paving Co., Chicago, Ill. | WPA, Treas., Proc. | Paving mixture | 17,450.00 |
| Indef. | Monolith Portland Cement Co., Los Angeles, Cal. | Treas., Proc. | Portland cement | Indefinite |
| 4/28 | Whitehall Cement Mfg. Co., Cementon, Pa. | WPA, Treas., Proc. | Portland cement | 16,980.25 |
| 5/31 | Peter Judlin, Inc., New Orleans, La. | WPA, Treas., Proc. | Portland cement | 15,640.00 |
| 3/30 | Independent Concrete Pipe Corp., Inc., Lockport, Ill. | WPA, Treas., Proc. | Concrete pipe | 18,442.50 |
| 6/30 | Basalt Rock Co., Inc., Napa, Cal. | Navy Purch. Office | Transit-mixed concrete | 64,030.00 |
| 4/3 | Great Lakes Steel Corp., Detroit, Mich. | WPA, Treas., Proc. | Crushed slag | 33,000.00 |
| 6/30 | C. G. Bridges, Escanaba, Mich. | WPA, Treas., Proc. | Gravel | 38,500.00 |
| 4/15 | Henry Steers, Inc., Northport, N. Y. | WPA, Treas., Proc. | Sand | 14,317.00 |
| 9/30 | Gallagher Bros. Sand & Gravel Corp., New York, N. Y. | Navy Purch. Office | Aggregates | 13,400.00 |
| 5/31 | Jahncke Service, Inc., New Orleans, La. | WPA, Treas., Proc. | Concrete sand | 15,765.00 |
| 5/1 | Whitehall Cement Mfg. Co., Cementon, Pa. | WPA, Treas., Proc. | Portland cement | 14,143.50 |
| 3/24 | Nelsen Concrete Culvert Co., East St. Louis, Ill. | WPA, Treas., Proc. | Concrete pipe | 13,986.00 |
| Indef. | Federal American Cement Tile Co., Birmingham, Ala. | TVA | Concrete roof slabs | 14,100.00 |
| Indef. | Lock Joint Pipe Co., Chicago, Ill. | WPA, Treas., Proc. | Concrete sewer pipe | 17,516.00 |
| 5/1 | N. Ryan Co., Inc., Brooklyn, N. Y. | Navy Purch. Office | Ready-mixed concrete | 20,825.00 |
| 6/24 | J. & I. O'Rourke, Inc., Flushing, N. Y. | WPA, Treas., Proc. | Ready-mixed concrete | 11,144.40 |
| 4/30 | Solvay Sales Corp., Detroit, Mich. | WPA, Treas., Proc. | Crushed stone | 10,700.00 |
| 12/31 | American Limestone Co., Knoxville, Tenn. | Agriculture | Grd. limestone | Indefinite |
| 12/31 | Liberty Limestone Corp., Rocky Point, Va. | Agriculture | Grd. limestone | Indefinite |
| 12/31 | James River Hydrate & Supply Co., Inc., Buchanan, Va. | Agriculture | Grd. limestone | Indefinite |
| 12/31 | Bertha Mineral Div. of the New Jersey Zinc Co., Austinville, Va. | Agriculture | Grd. limestone | Indefinite |

## Cancel Franchise Tax Against Cement Firm

### OVERRULED BY JERSEY BOARD

New Jersey's State Tax Board has ordered cancelled a $620 franchise tax levied by the state tax department against the Vulcanite Portland Cement Co. and has overruled the tax department's claim that the company was no longer entitled to franchise tax exemption because it abandoned operations at its plant at Alpha, near Phillipsburg.

The company claimed exemption under a statute which frees from the levy mining and manufacturing companies with at least 50 per cent. of their capital stock invested in mining or manufacturing pursuits and machinery. In 1935 a levy was made by the tax department after the Alpha plant temporarily suspended operations and that levy was set aside.

The tax department contended the company is liable for the tax now because the plant has been inactive since 1935 and part of the land is being rented to farmers.

The tax board, however, in an opinion written March 22 by Charles Quinn, board president, said continued inactivity when business conditions are poor is no indication the company plans to suspend cement manufacturing. Indication the company means to stay in business, he said, is the fact $21,000 was spent in 1937 for new buildings and that it continues to keep $2,798,827 worth of equipment in readiness for operation. Use of the topsoil for farming is of no consequence, the opinion said.

Another opinion set aside a franchise assessment against the Atlantic Brick Manufacturing Co. of Mays Landing, N. J., for the same reason. In this case the levy was $270.

## Jos. S. Young Again Heads Lehigh Cement

Joseph S. Young was re-elected president of the Lehigh Portland Cement Co. at its annual stockholders meeting in Allentown, Pa., recently.

Others named are: Raymond R. Bear, vice-president and general manager; B. L. Swett, vice-president and eastern sales manager; B. R. Rader, vice-president and western sales manager; John C. Bowen, vice-president and assistant eastern sales manager; R. H. Bright, controller; H. R. Hausman, assistant vice-president and assistant general manager; C. C. Long, secretary and assistant vice-president; C. E. Borman, assistant secretary and assistant treasurer; J. J. Hornung, assistant treasurer; C. H. Wescoe, assistant secretary and assistant treasurer, and K. J. Schatzlein, assistant secretary and assistant treasurer.

Declaration of a 25 c. dividend on common stock, payable May 1, and $1 per share on preferred stock, payable July 1, were made at the session.

Further improvement was observed in the company's safety record, with the Iola, Kan., plant adding its 12th consecutive year without a lost-time accident.

Wage rates, the annual report showed, have risen to 141 per cent. of those paid on the normal 1926 level, while the average mill net has been 85 per cent. of that year's figures.

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Delivery of ready-mixed concrete has been started by the Ready Mix Concrete Co. of Bloomington, Ind.

The company's plant is located at the property of the Bloomington Crushed Stone Co., which supplies the aggregates. Clark Colbert is manager.

## Recent Equipment Installations ★ ★ ★

Harry Wellnitz, Columbus, O., and the Tri-State Cemroc Co., Covington, Ky., are installing new Stearns Joltcrete machines in their concrete-units plants . . . *The Screen Equipt. Co. reports recent installations of Seco vibrating screens by the Alliance Sand Co., Palmerton, Pa.; West Roxbury Trap Rock Co., West Roxbury, Mass.; A. N. Farnham Co., New Haven, Conn.; A. Petrillo Co., Wilmington, Del.; and the B. V. Hedrick Gravel & Sand Co., Lilesville, N. C.* . . . The Blue Grass Stone Co., Lexington, Ky., has installed Lambert automatic skips in its quarry.

A Universal crusher and Simplicity screens have been installed at the Sinks Quarry, Winston-Salem, N. C. . . . *A new pump has gone into service at the Georgia Sand & Gravel Co. plant, Augusta, Ga.* . . . The Lincoln Cement Block Co, Kalamazoo, Mich., has installed a Stearns Clipper Stripper.

A Fairbanks-Morse gasoline engine, a Bay City shovel and a Universal double-deck screen have been recent new equipment additions at the Highway Hi-Test Sand & Gravel Co., Carlisle, Miss. . . . *Tyler and Allis-Chalmers vibrating screens have been placed in service by the Palmetto Quarries Co, Columbia, S. C.* . . . About 5,000 ft. of Naylor spiral pipe has been installed at the Pierce, Fla., phosphate plant of the American Agricultural Chemical Co.

L. M. Kennedy, Philadelphia, Pa., and the Cinder Concrete Products, Inc., Denver, Colo., have just purchased Stearns Joltcrete machines, while Russell the Coalman, Elkhart, Ind., is installing a Stearns Clipper tamper . . . *Recent installations of Seco (Screen Equipt. Co.) screens have been made by the Genesee Sand & Gravel Co., Bownmansville, N. Y.; Jefferson County Stone Co., Louisville, Ky.; Dolomite Products Co., Rochester, N. Y.; Virginia Feldspar Co., Bedford, Va.; and the Standard Slag Co., Wierton, Pa.*

## Residential Building Holds to High Level

### AT PEAK SINCE OCTOBER, 1929

March residential contracts, despite severe storms and a delayed spring, rose to the highest level on record since October, 1929. The gain over the March, 1938 total for the 37 states east of the Rocky Mountains amounted to 58 per cent., according to the F. W. Dodge Corp. The gain of 59 per cent. over February, 1939 was somewhat more than the usual seasonal increase.

Total contracts for all classes of construction started during March, amounted to $300,661,000 which represented a gain of 32 per cent. over March of last year and a further gain of 36 per cent. over February of this year. All major classes of construction contributed to these gains.

During the past month, the volume of F.H.A. mortgages accepted for appraisal has risen each week with almost continuous regularity. The total of $29,457,028 reported for the final week of March by the Federal Housing Administration was the highest amount for any week on record. These gains may presage further expansion in residential building as the year progresses.

Total construction contracts for the first quarter of 1939 have reached the highest volume in eight years. The gain over last year amounted to 44 per cent., while the increase over the first quarter of 1937, which represented the previous high point in the recovery period, amounted to 17 per cent. In residential building, the contract total for the first quarter represented a ten-year peak. The gain over the corresponding period of last year amounted to 83 per cent., and over the first three months of 1937 to 23 per cent. In non-residential building, corresponding gains over the first quarter of last year amounted to 30 per cent. while contracts for public works and utilities were 25 per cent. ahead of the first three months of 1938.

Further analysis of the construction record on the basis of ownership, reveals the fact that private building has shown far greater gains than public construction. For private work, the March record was 58 per cent. ahead of February while public work showed a corresponding gain of only 16 per cent. At the end of the three-months' period, private construction was 40 per cent. above last year. On the other hand, public construction, because of the unusually low totals during the early months of last year, registered a 47 per cent. gain over the first quarter of 1938.

## Motor Trucks Help to Lower Freight Rates

**AGGREGATES REALIZE BENEFIT**

The effect of increased motor-truck competition in lowering railroad freight rates on some commodities is brought out in an analysis reported recently by the U. S. Bureau of Agricultural Economics. The compilation shows an increase of nearly 100 per cent. in the relative share of the total inter-city freight traffic by motor trucks during the current decade, in contrast with a decline of over 14 per cent. in rail share of the total business.

Examples of commodities "whose rail rates have voluntarily been cut in response to truck competition," are cited by James C. Nelson in an article, *Effects of Trucking on Freight Rates* in the March issue of the Bureau's "Agricultural Situation." The list includes anthracite coal, sand, gravel, crushed stone and slag.

On the other side of the picture, Nelson states that "lack of vigorous truck competition may be a significant factor in explaining the relative stability of rail rates on such commodities as bituminous coal, building stone, salt, cement, ores, and other products moving long distances or in bulk.

The article concludes with the statement that unless an alteration is made in the policy of the railroads to maintain or increase rates—at times despite general price deflation—on traffic believed not susceptible to diversion or destruction, "increasing diversion of long-haul and heavy traffic to other means of transportation is likely. Sources of traffic may disappear where shifting to other agencies of transport is not possible, unless farmers can increase their efficiency of production to offset higher rates.

"This is also true even when the long-haul rates are kept stable in face of declining transport costs for competing shippers nearer markets. If producing areas develop closer to large consuming centers, the ton-mile volume of traffic in farm products will tend to decline."

## Declares Most Hydrate Plants Are Inefficient

According to Wm. J. Kuntz, president of Lime & Hydrate Plants Co., York, Pa., 90 per cent. of existing hydrate plants are operating at approximately 50 per cent. capacity because of inefficient operation methods.

"Before announcing this situation, we have made an exhaustive study of the subject and commercial application of our newly-applied principles and methods of operation. This is particularly true of Clyde and Schaeffer hydrators. After installing these methods on a Clyde hydrator at the plant of the J. E. Baker Co., Billmyer, Pa., without any increase in power application, manual or motive, we secured an increase of 3 tons per hr. and can still further the capacity 3 to 5 tons per hr. This means increase over former operating ability and also means increase per hr. The same results pertain to the Thomasville Lime & Stone Co. at Thomasville, Pa., where an increase of 3 tons per hr. was obtained with a much simplified operation and no additional power. E. E. Cooke is the manager at Thomasville and G. A. Hebbe is the general superintendent for the J. E. Baker Co.," Mr. Kuntz reports.

## Buffalo Gravel Man Jailed; Firm Fined

The Seneca Washed Gravel Corp. of Buffalo, N. Y., was fined $2,000 recently; Robert Pendergast, superintendent, sentenced to 6 months in jail; and his father, James J. Pendergast, secretary-treasurer of the firm received a suspended sentence by Justice Albert Conway of the New York State Supreme Court on charges of conspiracy to defraud the city of Buffalo in connection with deliveries of crushed stone for W.P.A. projects.

All were found guilty by a jury.

## Trinity Is Dismantling Old Arkansas Plant

The Trinity Portland Cement Co., Dallas, Tex., is beginning to dismantle the old plant of the American Portland Cement Co. at Foreman, Ark., which it owns.

The kiln, two grinding mills and a cooler will be reconditioned and shipped to one of its three Texas plants for future service, it is reported. The plant at Foreman has lain idle for many years.

The new plant of the J & K Stone Co. which recently started operating near Fairmount, Ind. K. K. Irving is general manager.

## Chicago Stone Firm Reports on Earnings

**COMPETITIVE PRICES BLAMED**

The Dolese & Shepard Co., important producer of crushed stone in the Chicago area, reported sales 79 per cent. higher in 1938 than in the preceding year with net profit amounting to $58,560, compared with a $32,982 loss for 1937. Profits are unsatisfactory, however, the company's pamphlet report reveals because of the existing level of competitive prices.

Excerpts from the report:

"A considerable amount of stripping was done during the year to make available for production the area containing the low-silicon-content dolomitic limestone for open-hearth, steel-mill and cupola use, of which approximately 18,000 cu.yd. were shipped in 1938. This deposit is one of the few remaining in the area. Under these circumstances our sales of this product should increase, and probably at higher prices, because of the scarcity of the product.

"Expenditures of approximately $34,000 were made during the year for certain new installations and replacements consisting, principally, of (1) screens and scalping screens to produce smaller sizes and cleaner stone; (2) quarry tracks to the new flux area; and (3) a new Diesel clamshell crane to expedite the loading, piling, and storing of the stone in piles. With these improvements, our plant continues to be one of the finest and most efficient in this vicinity.

"The demand for our agricultural limestone at higher prices was encouraging and we have improved and standardized the grades to fit specific uses and conditions. Our efforts, also, have been directed to induce long-distance truckers, who bring livestock into the Chicago markets, to return with a load of our agricultural limestone. This procedure is becoming more popular and is expanding our market."

President Wm. Roy Carney and all officers and directors were re-elected at the company's annual meeting on March 12.

## Applies for Permit to Dredge in Ohio River

The Nugent Sand Co. of Louisville, Ky., has applied to the United States Engineers' Office at Louisville for a permit to dredge sand and gravel from the Ohio River between Madison, Ind. and Louisville, it was announced by Lieutenant Colonel D. A. Davison, district engineer.

# EDITORIAL

## *Facts That Mislead*

WE live in what many call the most materialistic age in the world's history. We are more keenly and continuously aware of the importance of physical forces and material conditions than any previous generation of mankind; certainly we understand—or think we understand—more than any other about the physical phenomena that we observe about us. Facts—particularly the kinds of facts that lend themselves easily to numerical, or quantitative, presentation—have acquired a wholly unjustified influence in regulating our daily lives. We pride ourselves on the variety and extent of our knowledge of facts which in reality enslave us.

Our desire for accuracy knows no end. The electricity-cost of the refrigerator at home, the fuel economy obtained by a fourth gear in the transmission of our automobile, the financial return on a given investment—these and hundreds of other facts are known to us in figures often carried to two or three decimal places. Twenty-five cent slide rules are eagerly bought by boys in the chain stores; school girls talk glibly of calories; their mothers discuss the efficiencies of their food mixers.

The amount of cotton shipped to France, the number of automobiles in Calhoun County, the total sales of the retail outlets in Dodge City, the amount spent for clothing by families in the $5,000 annual income group—these are but samples of the millions of similar statistical facts available for those who want to know. The temperatures of your office, the relative humidity of your living room at home, the gasoline in your car's fuel tank, the balance in your checking account—a host of instruments and recording machines provide these and many other quantitative facts about what has been going on. At hundreds of points we lean unconsciously on the collectors and disseminators of statistical information. As a result we have a more complete and detailed record of the important and unimportant events of past time than has ever before been available to man.

But we have not been content to let these numerical facts serve for the past. Convinced of their great value to us in countless ways, we have attributed to them values they could not possibly possess. We have accepted them almost without question as infallible indicators of what is to come. The number of radios sold in Iowa last year is accepted greedily by manufacturers as a reliable index to the market there for similar machines this year. The number of two-family dwellings erected in Minneapolis in 1938 must of necessity, say the forecasters, indicate just how many will be built there in 1939. And so on, *ad infinitum*. Yet there is no direct, inevitable, or definite relationship between the fact and the expectation in either of these cases, nor is there any between the facts and the expectations in the thousands of similar cases in which records of the past are trustingly accepted and utilized as forecasts of the future. Our reverence for mathematics as the most exact of the sciences has led us into the habit of attaching undue weight to quantitative data and of attributing to them a dependability —almost an infallibility—that they can not possess. However accurate they may be as records of past events, they can not possibly have the same value with regard to future happenings.

CURIOSITY about the future has led man to invent some of the most fantastic ideas that afflict him. The same questioning spirit that leads the unmarried woman into the crystal gazer's tent pushes the business man into the arms of the business forecaster. And in each case the seller of promises trades on his customer's hopeful credulity, on his readiness to accept even false and ignorant prediction rather than his own judgment and initiative. Belief in the dependability of statistical soothsayers is just as naïve as that in the reliability of fortune-tellers; the dangers of following their advice are as great in one case as in the other. Many a business man who would dismiss with derision the chart of the astrologer will call a special directors' meeting to discuss the multi-colored trend and indicator diagrams of the professional peddler of industrial statistics. The length to which an absurd belief in the accuracy of their predictions can go is well illustrated by a recent conversation with a producer of building materials who, with a 150-year graphic record of building construction before him, pointed out an expected rise in construction activity in 1941 and said, in all seriousness, that he would make no important decision, take no important action, until that year arrived. The popularity of business-indicator charts among business men of all classes gives some idea of the extent to which they have grasped at what appears to be a quick and sure way to knowledge of future events and conditions. The task of catering to this childlike belief in the art of forecasting has brought into being many private and public agencies, which, despite their bulging archives and beautifully printed charts, know no more of what will occur than those who remain in utter ignorance

of their work. Their records and reports are often quite accurate as regards past events, and a knowledge of these may at times be useful as guides for future action, but their predictions are necessarily based on so many assumptions that they can not possibly deserve equal consideration with factual data.

THE prevalence of this widespread belief in the ability of certain persons to predict the future development, extent or nature of business in general, or even of any individual industry, works a hardship on all business, in our opinion. It has a strong tendency to make men less reliant on their own judgment, less confident of their own knowledge. It places them in the position of lacking decision, of waiting to see what the latest forecast will suggest, of hesitating to act, of mistrusting their own intelligence, of waiting for "the other fellow" to do it first. It stifles initiative; it makes business activity less and less dependent on individual decisions, on personal courage and faith, on the conditions peculiar to one's own business. It operates in the direction of standardizing opinion among large groups of business men; it encourages them to do nothing more often than it encourages them to take action; it has, therefore, undoubtedly been a powerful factor in bringing about sharp changes in public sentiment, at least in so far as this is reflected in the attitudes and in action of business men.

Forecasts that are based on, or that take account of, the theory of business or economic cycles are dangerous in that they lend an atmosphere of scientific truth and inevitability to what is at best only a theory and not a very sound one at that. By continually showing the ups and downs of the business curve during past decades and by stressing the cyclical trend brought out by such a curve these forecasts lead men to believe that this cyclical trend is bound to recur, that after so many years of declining business there must follow so many years of rising business and that these in turn will be succeeded by so many years of falling business to complete the cycle. Since those economists who know most about such matters can not agree among themselves when or where the upward or downward curve for any given period should begin, nor (for that matter) whether or not there is such a thing as an economic cycle, it seems presumptuous that anyone should offer at face value predictions that rely for their supposed validity solely on the acceptance of the business-cycle theory. (Parenthetically, we may say that it would be interesting to know, from a psychological point of view, to what extent the seven-year-cycle theory, for example, may be a survival of the biblical account of the seven lean and seven fat years, or of the magical value attached to the number seven by the Babylonians and others.)

As long as enough business men believe, for example, in the inevitability of economic crises, whether cyclical or not, we shall have them; because one of the most important factors—some psychologists say the most important factor—in the start, spread and prolongation of such economic collapses is the state of public opinion, the extent to which misgiving, fear and apprehension seize men's minds. Professional business forecasters—who, by the way, are much more often hopeless than hopeful and whose counsels are more often those of caution and procrastination than of courage and decision—are firm believers in the theory of the newshawk that "bad news is good news." The state of anxiety which they can so easily create in their readers' minds is conducive to a continuation of their patronage, because fear feeds on fear and the business man who has once allowed himself to become dependent on these "harbingers of evil days" only with great difficulty can regain his independence of judgment.

Too many business men are anxiously waiting for their weekly or monthly news letter in order to "know what to do." Too many have lost their faculty of independent thinking; too many have allowed these forecasts to determine their policies; too many unthinkingly repeat their dire predictions as they do the political prejudices of their daily newspapers. Too many business men waste their time trying to analyze public opinion, trying to ascertain how others —suppliers, competitors, customers, employees—will act, trying to out-guess their rivals. Too many business men are willing to let others think for them.

WE have referred on other occasions to the psychological dangers of the stock and commodity exchanges and we mention them again here because the anxieties they create in the public mind are out of all proportion to the real importance of what they do. The regular reader of stock-market reports fancies that those whose purchase and sales are recorded there are a group of intellectual and economic *élite,* possessed of special insight into the future or favored with private knowledge of what will happen in the future, and that what this specially-privileged body of men—which, incidentally, changes in identity, objectives, theories and operations every day—may do from hour to hour actually affects the economic stability of this country. As long as such puerile beliefs are common business men will sicken and die long before their time and business will become increasingly hazardous for men in all walks of life.

Business men need all the facts pertinent to their business activities that they can acquire, but unless they know how to interpret them, what to accept, what to reject, and what to apply, they will be at the mercy of the undependable and necessarily contradictory forecasts of every industrial prophet they meet. We are in that dangerous stage of knowing too little to be sure and too much to be secure. We are wallowing in the mire of facts that mislead.

By HARRY F. UTLEY

# New Tractor and Dump-Trailers Cut Strip-Hauling Costs at Silica Plant

Shovel loading the first of the two trailers. Note depth of the overburden in the background.

THE silica sand produced from the St. Peter sandstone formation in the vicinity of Ottawa, Ill., is among the finest and purest in the world. The deposit at Wedron, located on the Fox River about 12 mi. northwest of Ottawa, has yielded millions of tons of this important industrial mineral during the last half century as the huge, gaping holes in the earth's surface will attest. As quarrying advanced farther away from the original workings the overburden has become increasingly heavy until now it ranges up to 60 ft. or more in depth.

Removal of this mass of earth and clay in recent years has become a time-consuming, costly problem for the Wedron Silica Co. This concern, always a leader in its field, progressive in its processing and marketing methods, has been quick to adopt the newer, proved operating procedures that promised to cut production costs and improve the quality of its product. As a result, in January of this year the old locomotive-and-cars method of hauling away the overburden was abandoned in favor of tractor-drawn, crawler-mounted trailers and the results to date have certainly justified the change. More yardage is being moved than was possible formerly when two trains of 5-cu.yd. side-dump cars drawn by small locomotives over narrow-gauge tracks were used. The number of men required for stripping has been reduced 40 per cent. Constant and costly delays made necessary by shifting and relaying trackage every two or three days are being avoided. And fuel costs have dropped away down. The overburden is dumped into a worked out section of the quarry and frequent slides often used to leave the track hanging, another disadvantage which has been done away with by adopting the new method.

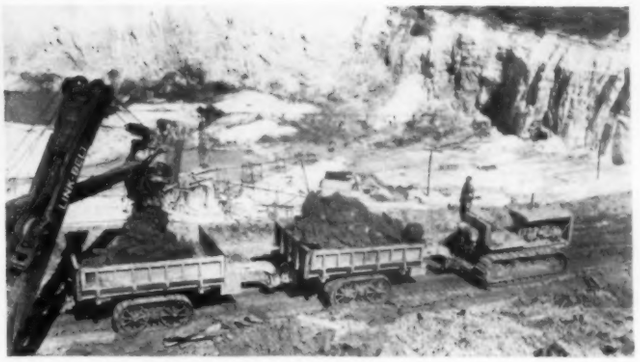
The same Link-Belt 1¼-cu.yd. gasoline shovel formerly used to load the cars scoops the overburden into two Athey Forged-Trak crawler-mounted trailers. Each has a heaped capacity of 13 cu.yd. of material. Loading is accomplished in about 7 min. Then the big D8 Caterpillar Diesel tractor trundles off, the two trailers are dumped by hydraulic hoists controlled by the driver from his seat in the tractor, and the train returns to the shovel at surprising speed. With both the tractor and trailer units mounted on track-type treads, operations are not hampered by weather or ground conditions as this equipment maintains its own roadway. The Athey trailers can dump from either side, down-folding gates discharging the material clear of the wheels and over the edge of the fill without the necessity of stopping.

When the locomotive-and-cars method was in use 5 men were required—2 on the locomotives, 2 leveling at the dump, and 1 for service and maintenance. Now only 3 men are needed—1 on the tractor, 1 for service and maintenance, and 1 leveler at the dump. The elimination of the extra man at the dump comes about because of the fact that the flat treads of the crawlers on the tractor and trailers enable this equipment to travel along the very edge of the dump, leveling and compacting the fill.

Just how much more dirt is being hauled and what the new method is

Partial plant view showing screening-and-storage building at left, drying building, right.

Overburden was formerly hauled with two trains of side dump cars, one of which is shown here.



These are the trailers and Diesel tractor installed early this year. Quarry and pipe-lines in the distance.

saving the company can not be determined exactly at the present time since the new equipment has not been in service long enough to figure maintenance or write off depreciation. Supt. John A. Dummett reports, however, that in the wintry month of February of this year the new units hauled 12,330 cu.yd. of material, used 333 gal. of fuel oil costing 9 c. per gal. at a per cu.yd. cost for fuel and labor of but 3½ c. In the two preceding years, using the locomotives and cars, an average of 88,170 cu.yd. of spoil was hauled annually at an average annual cost of $5,225 for fuel and labor alone—or about 6 c. per cu.yd. On that basis, it is expected that the tractor and trailers will move between 140,000 and 150,000 cu.yd. of material this year at a fuel-and-labor

Dumping a load. Material is discharged over the edge of the fill and clear of the wheels.

expense of not more than $5,000. Fuel cost for the tractor is now less than the 9 c. per gal. used in determining the February, 1939 costs because the company has just installed tank-storage facilities and is now buying Diesel fuel by the tank-car. At first it was purchased in drums which were delivered by trucks.

There have been a few other changes at the plant since it was completely described and illustrated in the April, 1933 issue of Pit and Quarry. Improvements made since that time include the installation of three 6-in. Allen-Sherman-Hoff Hydroseal pumps. These have replaced a series of Pulsometers and a drag-elevator to the washing plant. The siliceous material, after being loosened by conventional blasting methods, is washed down hydraulically with hose streams to a sump at the pump-house on the quarry floor from which two Hydroseal pumps, in series, force it about 1,600 ft. up a 105-ft. elevation to the washing building at the plant. After being washed, another 6-in. Hydroseal pump forces the material through a tunnel to the draining and drying building across the railroad tracks. The new pumps are said to have increased the raw-material capacity more than 15 per cent.

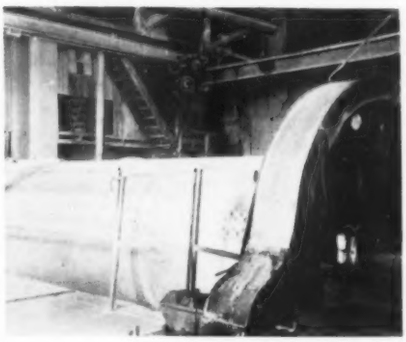
In the grinding building, a third 6-ft. by 22-ft. Allis-Chalmers tube-mill has recently been installed, increasing the capacity for grinding silica flour by the same ratio.

After being washed and drained the sand is steam-dried, carefully screened, some of it ground to varying degrees of fineness and bagged, while the major portion of the output is shipped in bulk in box-cars.

The Wedron plant has pioneered in

The tractor and trailers en route to the spoil dump.

the prevention of silicosis through educational efforts among its employees and by installing the latest in mechanical safeguards. In 1922, when the present plant was built following the destruction of the original buildings by fire, a Sly dust-collecting system was installed. This has been enlarged and improved from time to time so that operations are now practically dustless.



Three tube-mills, one of which is pictured here, are used to grind the fine sand.

Screens and other equipment are inclosed and connected to the system, while all the workmen in the operating departments must wear respirators.

Because of its exteme abrasiveness, the silica sand causes considerable wear on the equipment handling it. By hard-surfacing with Stellite such parts as bag-packer housings and feeder blades, dipper teeth, etc., are made to give much longer service.

The main offices of the Wedron Silica Co. are maintained at 38 S. Dearborn St., in Chicago, the plant being but 80 mi. distant. A. Warsaw, its president and general manager, is a well-known figure in the domestic industrial-sand industry, having taken a prominent part in the formation of the National Industrial Sand Assn., and having served as its president until last year when he asked to be relieved of his duties. M. H. Crissey is vice-president and secretary, and E. F. Swift, Jr., is treasurer. The output of the plant is widely distributed to the glass industry, foundries, ceramic trades, roofing, paint and fertilizer industries.

# The Lubrication of Equipment

## III. Air Compressors

By JAMES I. CLOWER
Associate Professor of Machine Design
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THE reciprocating type of compressor is used predominantly in pit-and-quarry operations. Generally, the compressor is of the 4-cylinder, single-stage, horizontal type. The discharge pressure is usually between 50 and 150 lb. per sq. in. Compressors operate generally within the speed range of 120 to 350 r.p.m., although the small, portable units usually operate at between 600 and 900 r.p.m. They are obtainable in capacities ranging from 2 cu.ft. per min. for the very small, single-acting, air-cooled units to approximately 8,000 cu.ft. per min. for the very large, double-acting, stationary, water-cooled machines. They may be direct-connected or driven through a flat or V-belt, chain, or gearing by the power unit, which may be either a steam, oil, gasoline or Diesel engine or an electric motor.

*Parts Requiring Lubrication.* — The lubrication of the reciprocating compressor involves a consideration of (a) the cylinder or internal parts, and (b) the external parts.

The internal parts consist of: (a) the piston and cylinder; (b) the piston rod, if double-acting; and (c) the valves, if of the poppet or Corliss type. The external parts are: (a) main bearings; the (b) crankpin and crosshead-pin bearings; (c) the crosshead guides; and (d) a few miscellaneous bearings.

*Cylinder Lubrication.*—Air-compressor cylinder oil is required to perform three functions: (1) reduce friction losses to the minimum; (2) minimize cylinder, piston and ring wear; and (3) provide an air-tight seal between the piston and the cylinder wall.

The effectiveness of cylinder lubrication depends chiefly on the following five factors: (1) Cleanliness of the intake air, (2) effectiveness of the cooling system, (3) methods of oiling, (4) oil characteristics, and (5) operating conditions.

*Cleanliness of Intake Air.*—Most air-compressor operating troubles are caused by feeding too much oil to the cylinder and by dirty intake air. Atmospheric air is never clean, especially around pit-and-quarry operations. The dirt concentration of the air varies widely, of course, with different localities. The following, however, are approximate averages for various areas:

Rural and suburban districts 0.2 to 0.4 grains per 1,000 cu.ft.

Metropolitan districts 0.4 to 0.8 grains per 1,000 cu.ft.

Industrial districts 0.8 to 1.5 grains per 1,000 cu.ft.

These quantities may appear rather insignificant, but actually they are not. For example, approximately 1 lb. of dirt would be taken in per hr. by a 1,000-cu.ft. compressor located in an industrial district.

Atmospheric dirt varies widely, but generally it consists of bits of carbon, sand, ashes, paper, particles of animal and vegetable matter, much of which is often very abrasive, especially around quarries and sand-and-gravel plants. Unless the air is properly filtered these impurities enter the compressor and cause excessive wear and combine with oil to form so-called carbon deposits, which interfere with the proper operation of the valves and rings, clog the air passages, increase the discharge temperatures, and decrease the volumetric efficiency of the compressor.

*Air-Filters.*—Air-filters generally operate on one or a combination of two or more of the following principles:

(a) Straining of the air through a closely-compacted mass of material, such as cloth, felt, spun glass, copper or steel wool, hair, fiber and an oil bath.

(b) By causing the air to impinge against a series of oil-coated baffles so arranged that it is virtually impossible for any air to flow through the filter without coming into contact with several baffles.

(c) By an arrangement of baffles, deflectors, and partitions such that the air is given a decided whirling motion as it flows through the filter, thereby effecting by centrifugal force a separation of the air and the impurities.

Three designs of air filters which employ these principles are shown in Figs. 1, 2 and 3.

Thorough cleaning of the air pays large dividends on the best and most efficient air-filter obtainable. Correct air-filter practice reduces operating and maintenance costs and insures trouble-free air-compressor operation.

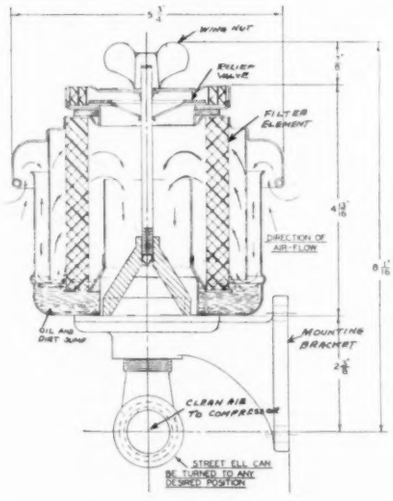


**Fig. 1—Combination air-compressor filter and silencer having a built-in relief valve.**

*Effectiveness of Cooling System.* — The temperature of air rises during compression, because the work done in reducing the volume and in increasing the pressure is converted into heat. This is known as the heat of compression, and both air and water are used to remove it from the cylinder as rapidly as is possible during compression. But it is impracticable to remove it all as fast as it is produced, hence the temperature of the discharge air generally ranges from 200 to 350 deg. F. under normal operating conditions. Many troubles usually arise when for any rea-

**Table I.—GUIDE TO RATE OF OIL FEED FOR AIR-COMPRESSORS**

| Cylinder Diameter (*in.*) | Displacement (*cu.in.*) | Rubbing Surface (*sq.ft.*) | Oil Feed per Cylinder | |
|---|---|---|---|---|
| | | | Drops per min. | Pints per 10 hr. |
| Up to 6 | Up to 65 | Up to 500 | 1 | 0.05 |
| 6 to 8 | 65 to 125 | 500 to 750 | 1 | 0.08 |
| 8 to 10 | 125 to 225 | 750 to 1100 | 1 | 0.11 |
| 10 to 12 | 225 to 350 | 1100 to 1500 | 1 to 2 | 0.14 |
| 12 to 15 | 350 to 600 | 1500 to 2000 | 2 to 3 | 0.20 |
| 15 to 18 | 600 to 1000 | 2000 to 2600 | 3 to 4 | 0.27 |
| 18 to 24 | 1000 to 1800 | 2600 to 3600 | 4 to 5 | 0.36 |
| 24 to 30 | 1800 to 3000 | 3600 to 4800 | 5 to 6 | 0.48 |

Table II.—GUIDE TO SELECTION OF AIR-COMPRESSOR OILS

| Compressor Characteristics | | | Oil Characteristics | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Type of Compressor | Air Pressure (*lb. per sq.in.*) | Parts | Viscosity, S.S.U. 100°F. | Viscosity, S.S.U. 130°F. | Viscosity, S.S.U. 210 F. | Flash-Point (°F.) | Fire-Point (°F.) | Compound (*per cent.*) | Type of Oil |
| Reciprocating (all types) | Less than 150 | Cylinders and bearings | 320 | 143 | 50 | 390 | 445 | 0 | Distillate |
| Reciprocating (all types) | 150 and over | Cylinders | 415 | 175 | 53 | 400 | 450 | 1 | Distillate compounded |
| Reciprocating (all types) | 150 and over | Bearings | 320 | 143 | 50 | 390 | 445 | 0 | Distillate |

*General Requirements:* Air-compressor cylinder oils should be high-quality distillates having the highest possible flash-point consistent with viscosity. They should not contain any water, sediment, acid, soap, resin, cylinder stock, or any other deleterious substances. The pour-point should be at least as low as the lowest temperature encountered in service. Where compounded oils are required, the compound should be either lard or tallow oil and not rape-seed oil, which is more susceptible to oxidation than the former oils.

son the normal operating temperature is exceeded. Normal operation is never assured, as is evident from the following factors which tend to cause overheating: (1) Too warm intake air, (2) too warm cooling water or air, (3) insufficient water or air circulated around the cylinder and head, (4) overloading or forcing the compressor beyond its capacity, (5) leaky discharge valves caused by deposits, and (6) deposits in the cooling-water jacket or on the air-cooling fins.

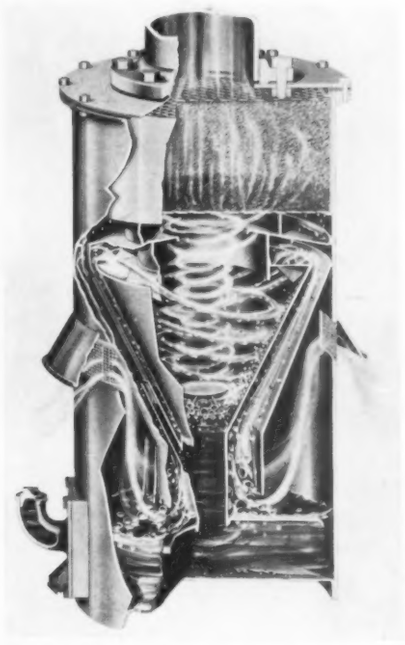

Fig. 2—Filter designed for very dirty air. It is obtainable in capacities from 230 to 1,750 cu.ft. per min.

For single-stage compressors the temperature of the discharge air is roughly increased 2 deg. F. for each degree increase of intake air. It is important, therefore, that the end of the intake pipe be located in as cool and clean surroundings as can be provided.

Repeated leakage of hot air back through the discharge valves may heat the valves to dangerously high temperatures with the ultimate possibility of causing failure, fire, or, in extreme cases, an explosion. This is particularly likely to occur if carbon deposits are allowed to collect on the discharge valves.

*Methods of Oiling Internal Parts.*—The cylinders of air-compressors require a sparing but uniform oil feed, as shown in Table I. It is imperative for trouble-free operation that the method of application be such that the feed can be reduced to the small quantity required and at the same time be unfailing. Generally, it is supplied by one or a combination of two of the following three methods: (1) Mechanical force-feed oiling, (2) splash oiling, or (3) drop-feed oiling.

Mechanical force-feed oiling, which employs a mechanical force-feed lubricator, Fig. 4, makes it possible to feed a measured quantity of oil into the cylinder at a rate proportional to the speed of the compressor. The feed can be accurately adjusted and remains so regardless of the amount of oil in the lubricator and temperature variation. This type of lubricator can also be timed to deliver oil to the cylinder at the instant the piston is in such a position that the oil can be injected between the rings. Such timed delivery results in effective oil distribution, as the rings spread the oil evenly over the cylinder wall as the piston moves back and forth. Mechanical force-feed oiling is the most reliable and satisfactory means of applying oil to compressor cylinders, especially for all except single-acting, splash-lubricated units.

For horizontal compressors the oil is generally introduced through a single lead at the top center of the cylinder. Large horizontal machines may be provided with two or more leads spaced around the cylinder midway of the stroke. In some cases it may be advisable to run a lead to the stuffing box.

Where more than one point of delivery is required, each lead should connect to a separate pump unit of the lubricator, otherwise it is impossible to adjust the feeds to meet requirements.

Formerly many compressors were equipped with sight drop-feed oilers, Fig. 5. These oilers are provided with an equalizing tube which connects from below the orifice to the space above the oil in the reservoir. The pressure thus being equalized, the oil flows by gravity into the cylinder. These oilers are not inherently capable of close feed adjustment, nor are they fully reliable as the orifice easily becomes clogged. Moreover, the feed is markedly affected by

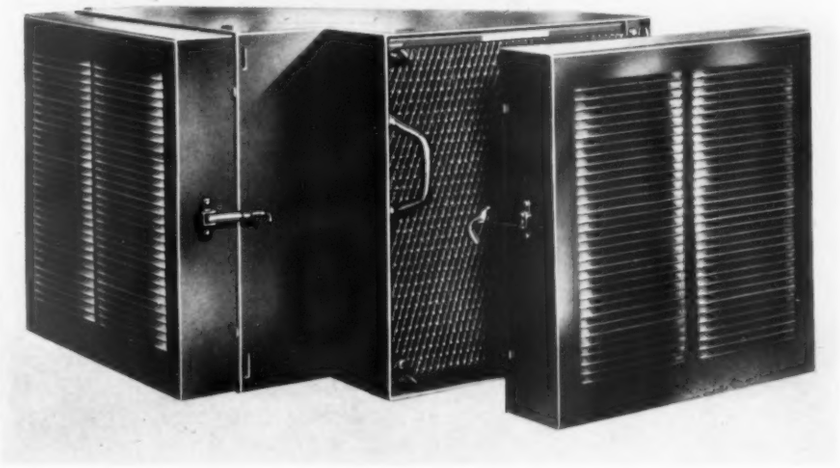

Fig. 3—Showing the design of an impingement-type filter for large compressors.

temperature and variations in oil level.

Splash oiling is widely used for small, vertical, angle, and horizontal, single-acting compressors. The connecting rod or an extension of it dips into or strikes the oil in the crankcase, thereby splashing it on the cylinder walls and all other parts. The quantity of oil that passes the rings into the cylinder is more or less controlled by the oil rings. But if the rings are badly worn, or if the proper oil level is not maintained in the crankcase, practically all control of the amount of oil that enters the cylinder is lost. Should the oil level become too low, the parts generally do not receive sufficient oil and excessive friction and wear result. Should the oil level be maintained too high, excessive oil enters the cylinder, thereby causing high consumption and excessive carbon deposits. Too high an oil level also promotes oil oxidation by churning excessive air into the oil.

Most splash-lubricated compressors have troughs and partitions so arranged as to maintain the oil level at the correct height (Fig. 6).

*Oil Requirements and Characteristics.*—To a large extent successful air-compressor cylinder lubrication depends on the use of a correct oil and its proper application. Faulty lubrication leads only to troublesome difficulties, inefficient operation, and eventually costly shut-downs, and sometimes dangerous explosions. For these reasons, cylinder oils for air-compressors should be *carefully selected* and *properly applied*.

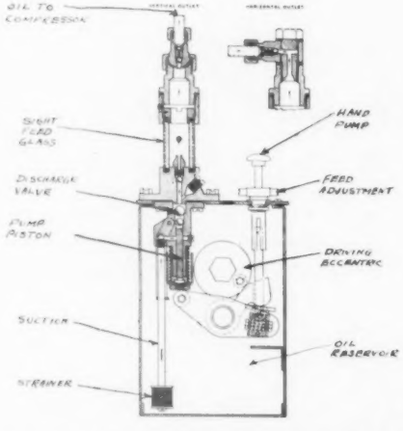


Fig. 4—Typical mechanical force-feed lubricator.

Most operating and maintenance troubles, such as so-called carbon deposits, sticking valves, compression leaks, and high operating temperatures, are directly traceable to over-lubrication, the use of incorrect oil, or dirty intake air. The oil fed into an air-compressor cylinder is not burned, as in an internal-combustion engine cylinder, and, if of high quality, the amount evaporated is nil. Consequently, only a small amount of oil is required to maintain an efficient film on the rubbing surfaces. Troubles caused by insufficient oil are seldom encountered. Any increase in the feed above that required to provide an effective piston seal and reduce friction to the minimum tends to increase the likelihood of an explosion or fire.

The most reliable method of determining whether or not the feed is correct is by an inspection of both the suction and discharge valves. If the valves are dry or rusted, the feed is insufficient and should be increased. If oil has accumulated in the ports and clearance spaces, the feed is excessive and should be reduced. If all the parts show a uniform film just sufficient to stain through one or two cigarette papers, the feed is correct.

Because of the many different designs, makes, and types it might be supposed that several oils would be required for air-compressor cylinders. But such is not the case, as shown in Table II, which is considered a reliable guide for selecting air-compressor oils.

*Viscosity.*—The correct viscosity is determined by the operating temperature, the pressure, and the mechanical condition of the cylinder. Under normal operating conditions the temperature of the oil film on the cylinder wall is between 125 and 200 deg. F. Consequently the viscosity of the oil at these temperatures is very important. If the oil is too thin, excessive wear will result, and the piston will not be effectively sealed and blow-by will occur. If the oil is too thick, the operating temperatures and friction increase and excessive carbon deposits are prone to form.

The viscosity at low temperatures is of importance when a machine is exposed to cold weather, as is often the case with pit-and-quarry machines. Under these conditions the oil should be sufficiently fluid to flow freely when the machine is started.

In regard to pressure the important consideration is not the maximum discharge pressure, but rather the pressure difference that exists on opposite sides of the piston. It is this pressure difference that tends to cause blow-by and forces the rings against the cylinder wall. The greater this pressure difference is, the more difficult it becomes to seal the piston and maintain a film of oil on the cylinder wall.

As the cylinder and rings wear many operators resort to the use of heavier oils in order to prevent blow-by. This practice should not be carried too far, because heavy oils are prone to cause excessive friction and carbon deposits. If the wear becomes excessive, the cylinder should be rebored and new rings installed. In all cases an oil having the lowest viscosity consistent with effective piston seal and minimum friction should be used.

*Carbon Residue.*—The Conradson carbon-residue valve is of some value in selecting compressor oils, but it is not the sole factor in determining the probable amount of carbon that will be formed in an air-compressor. The concentration of impurities in the air, the operating temperature, and the viscosity of the oil at the operating temperature are also important factors.

Mineral oils are composed of many different hydrocarbons, each having a distinct boiling-point at which it vaporizes. The low-boiling hydrocarbons vaporize first, leaving the high-boiling ones as a residue. These high-boiling hydrocarbons, being in intimate contact with hot air, are prone to oxidize or decompose to form sticky, tarry material which acts as a binder for the impurities in the air, as well as for the real carbon remaining as a result of the vaporization of the low-boiling hydrocarbons.

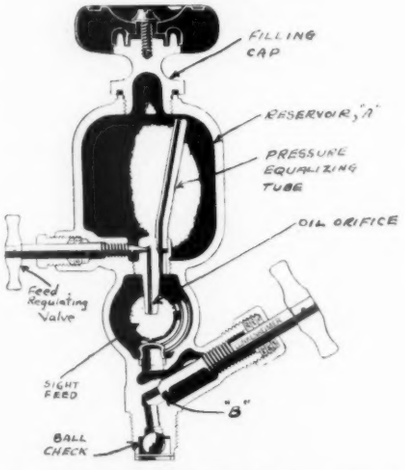


Fig. 5—Sight drop-feed oiler for pressures up to 250 lb.

This mass, consisting of air impurities, oxidized oil, and some real carbon, bakes under the continued high temperatures in the cylinder into a more or less hard deposit. In some cases these deposits are soft. In general, the real carbon is less than 25 per cent. Bits of silica, iron, copper, and many other materials are always present, which proves that a considerable portion of all so-called carbon deposits consist of air impurities, and metal particles worn from parts of the compressor. The real carbon portion, with few exceptions, depends on the character of the oil. Other factors being equal, the higher the viscosity of an oil and the carbon-residue value, the greater is the tendency of an oil to form carbon deposits. Likewise, paraffin-base oils are prone to deposit more carbon than other base oils because of their usually higher carbon-residue value. (*Continued on page 49*)

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By W. E. TRAUFFER

# Corson Family, Maker of Lime Since 1822, Keeps in Step with Progress

THE highly competitive conditions existing in the nonmetallic-minerals industries have made it necessary for a producer to keep in close touch with all the latest developments and adapt the most practical of these to his operations in order to survive. The firm of G. & W. H. Corson, Inc., Plymouth Meeting, Pa., has managed to keep well abreast and in some ways ahead of these industries in this respect.

The Corson family began its long connection with the lime industry in 1822, when Alan W. Corson started burning lime near Plymouth Meeting. His son and nephew, George and Elias H. Corson, followed in his footsteps and carried on this business from 1837 to 1880. George and Walter H. Corson, sons of Elias H. Corson, then took over and their corporate title is still used. The three sons of Walter H. Corson now carrying on the business are Philip L. Corson, Bolton L. Corson, and Carroll L. Corson. C. C. Fulmer is in charge of operations.

A general view of the plant showing the car on incline to the kilns.

Truck discharging stone into one car while the other is being hauled up the incline.

The company's plant is located at Williams, Pa., several miles east of Plymouth Meeting. Here crushed stone, pulverized limestone and agricultural limestone, quick and hydrated lime, lime plaster, "Corsonite" masonry cement, and "Cordol" roasted dolomite are now produced. Rock wool is manufactured at another location. About 5 years ago shovels replaced hand loading in the quarry and in 1936 the handling of the stone was completly mechanized. A Wood gas-producer was installed in 1937 and other burning improvements have since been made. The production of roasted dolomite and pulverized limestone was begun in 1932.

The stone in this quarry is a hard dolomitic limestone containing about 55 per cent. $CaCO_3$ and 43 per cent. $MgCO_3$. It varies in color from yellow to blue. Snake holes are used to shoot down the 40-ft. to 80-ft. face. Drilling is done with an Ingersoll-Rand wagon drill. Secondary shooting was formerly done in the usual manner but about three years ago the company started using a "skull cracker" for this purpose. This 6,600-lb. steel ball, cast by the American Bridge Co., is handled by a Thew gasoline crane. According to Philip L. Corson, this method is ideal as the plant is in a fairly well settled area and it has also shown a saving of from 2 to 3c. per ton of stone quarried.

The 1½-cu.yd. shovel loading truck in quarry.

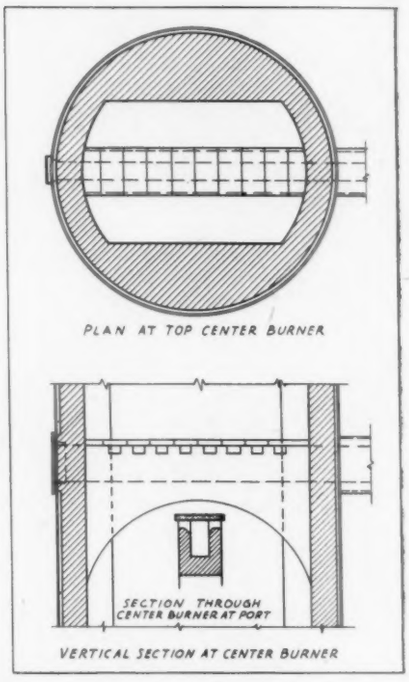
The "skull cracker" used to break large rock.

Stone is loaded by a Thew Lorain 75 shovel and a Byers shovel, both with 1½-cu.yd. dippers and gasoline engines. Two Mack trucks, with a third in reserve, are used to haul the stone to an incline, where it is discharged from a ramp into two 7½-ton steel quarry cars. These are used on a

single-track incline with a switch near the loading point. While one car is being hoisted to the plant the other is receiving a load from one of the trucks.

The cars are dumped by an original and delicately-balanced system. A hook, operated by an overhead electric hoist, is engaged in an eye on one side of the car body and lifts it until gravity begins to carry it over. At this point the opposite or discharge side of the body engages a sliding bar which has counterweights to slow down the drop. When the car is empty the hoist, which is still engaged, starts the body back upward and the counterweighted mechanism pushes it back into position. Some experimenting was necessary before the correct amount of counterweight and the correct location for the hoist were determined. The car wheels on the side opposite the discharge are held down by a special clamp while this is going on. This method is much more simple than it sounds and the entire operation takes only a few seconds.

The stone is discharged from the cars into a 25-ton steel hopper from which the discharge is controlled by a Ross chain feeder into the 40-in. by 42-in. Farrel Bacon primary jaw crusher. The crusher product, minus 8-in., is carried on a 36-in. pan-conveyor to a live-roll grizzly with 4-in. openings.




The material retained on this grizzly is kiln stone and is carried on another pan-conveyor to a bin. One and one-half-cu.yd. steel cars are loaded under this bin and carry the stone up an incline to the six shaft kilns.

These have 13-ft. diameter steel shells and are 56 feet high from the ground floor, and 40 ft. from the firing floor. The kiln shafts are 11½ ft. in diameter at the top and have a cross-section area at the furnace of 60 sq. ft. Each kiln is fired through center burners with gas from an R. G. Wood gas-producer. Using a 14,000-B.t.u.

Inside of kiln just after drawing and before partially-calcined rock had caved down. Note white-hot refractories in center burner.

Another view in kiln after burner was turned on and suspended rock had started to fall.

The chain feeder which regulates stone feed to primary crusher.

high-volatile coal, a fuel ratio of 5½ to 1 and a daily capacity of 35 tons per kiln are being obtained. The kilns are hooded and all operated under induced draft.

Considerable difficulty was experienced in finding a material for the top of the center burner which would withstand both the intense heat of the gas flame and the shock and abrasion of the falling rock when the kiln is drawn. Of the materials tried only the

Interior of another kiln showing silicon-carbide tiles with fire brick above.

Carborundum tile now used proved to be satisfactory. The 12-in. by 24-in. by 3-in. thick Carbofrax tiles containing 85 per cent. silicon carbide are laid in a single row across the top of the burner and a single row of fire-clay tiles above these helps to absorb shock and abrasion but is exposed only to the comparatively low burning zone temperatures of 2,200 to 2,300 deg. F. High-alumina brick is used in other parts of the burner where the heat is not excessive. According to Mr. Corson, the Carbofrax tile has been used for 15 months under these severe conditions without deterioration or fusing.

The 3-ft. spherical-head crusher used for reduction of coarse rock.

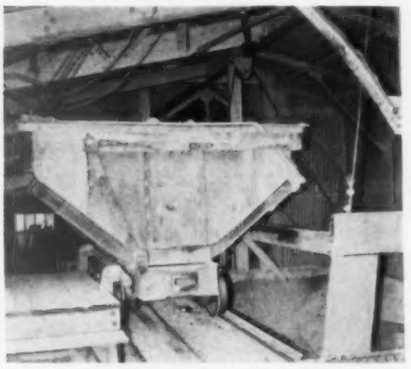
Another interior view showing center burner after kiln had been cooled off.

The kilns are drawn every 3 hr. through shear gates. A 4-ton car is used to transfer the lime into a cooling and storage bin. The departments for manufacturing pulverized and hydrated lime, masonry cement and lime

Truck-mounted clam-shell crane loading stock-piled stone into a truck.

plaster are supplied from this bin.

The fine stone (minus 4-in.) passing through the line-roll grizzly is discharged by a second Ross chain-feeder on a belt-conveyor feeding a Telsmith vibrating scalping screen with 1¼-in. openings. Stone passing through this



The balanced car-dumping system with hoist, wheel clamp and counterweight.

screen is discharged into a 5-ft. by 30-ft. Bartlett & Snow rotary drier. The material passing over this screen is discharged into a 10-in. by 30-in. Good Roads jaw crusher.

A belt-conveyor carries the crusher product to a bucket-elevator, which also receives the product of the drier. The stone is discharged from this elevator on a 4-deck Kennedy-Van Saun vibrating screen which is followed by a Link-Belt 2-deck screen. These do some of the final sizing and any of the coarser sizes can be discharged into a 3-ft. Telsmith Gyrasphere spherical-head crusher.

A bucket-elevator feeds this crusher's product to a pair of 2-deck final sizing screens, one a Telsmith and the other a Niagara. Any of the finer sizes from the primary sizing screens can be carried on a belt-conveyor to the final screens. Stone from the drier can also be fed to a Fuller-Lehigh air-swept mill for pulverized limestone. There is bin storage for 1,000 tons of these products and ample stock-piling capacity. Two Universal cranes mounted on Mack trucks and handling Owen clam-shell buckets are used to load trucks from stock-piles. American Blower Co. Sirocco dust-collectors are connected to the drier and to the crushing department. This department has a capacity of 800 tons of crushed stone and 80 tons of pulverized limestone daily.

## Stroh Will Disposes of $10,000,000 Estate

The will of the late Emil Stroh, former president of the Wabash Portland Cement Co. and Detroit brewer, disposing of an estate estimated to exceed $10,000,000 has been filed for probate at Detroit. The bulk of the estate is to be set up as trust funds for the benefit of the heirs. A $10,000 trust fund is also to be established to care for the building and grounds surrounding the Stroh family mausoleum at Coldwater, Mich.

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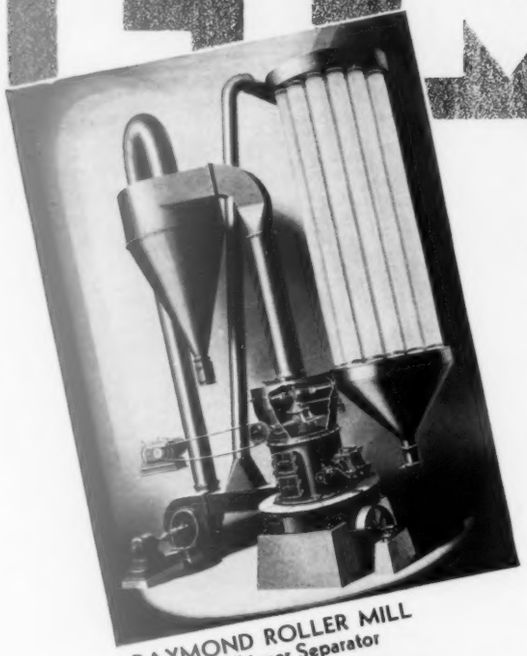

RAYMOND ROLLER MILL with Whizzer Separator

### LIMESTONE and QUICKLIME . . . . . .

In handling large capacities where power consumption is a major factor, there is no combination of machines equal to the single Raymond unit, shown at left. This whizzer-equipped Roller Mill pulverizes, classifies and conveys the product in an enclosed dustless system to storage by one continuous, automatic operation.

The power cost per ton in grinding quicklime is extremely low, and any grade can be readily produced, from 50 to 200 mesh material, simply by changing the speed of the whizzer while the mill is running. This mill is equally efficient in grinding limestone to uniform fineness, as in making fillers or fertilizers.

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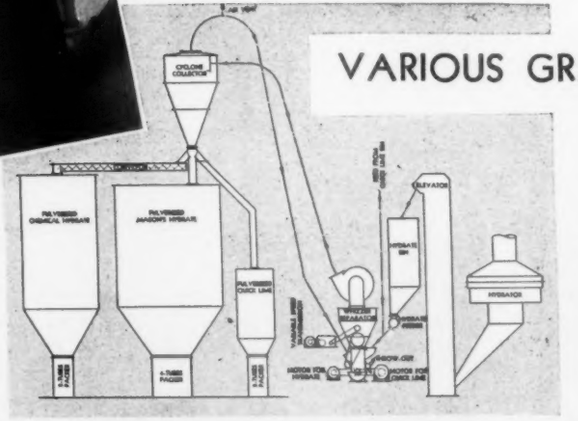
Maximum specifications for high purity hydrated lime can be obtained economically with the Raymond Automatic Pulverizer and whizzer type separator, equipped with the throw-out attachment. It takes the lime from the hydrate bin, disintegrates and classifies the material, while rejecting impurities by the throw-out device. This modern unit produces any fineness, from agricultural lime up to superfine chemical hydrate, testing 99.5% passing 400-mesh . . . and without loss of good hydrate.

AUTOMATIC PULVERIZER with Whizzer Separator

### VARIOUS GRADES of LIME . . .



The diagram shows a practical set-up for a plant, making either pulverized quicklime, or mason's finishing lime and chemical hydrate. One Raymond Automatic Pulverizer with whizzer separator does the job. Raymond also builds the new double whizzer type of Mechanical Air Separator for separating lime direct from the hydrator . . . and the famous Bowl Mill for direct-firing rotary lime kilns.

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By W. E. TRAUFFER

# Kentucky Lime Maker Also Produces Masonry Cement and Limestone

General view of the Pine Hill operations; kilns at left, crushed-stone plant at right.

Truck-load of stone leaving the mine entrance. The gate is locked at night, the mine serving as a garage.

One of the buckets being loaded while a filled bucket is about to be carried away.

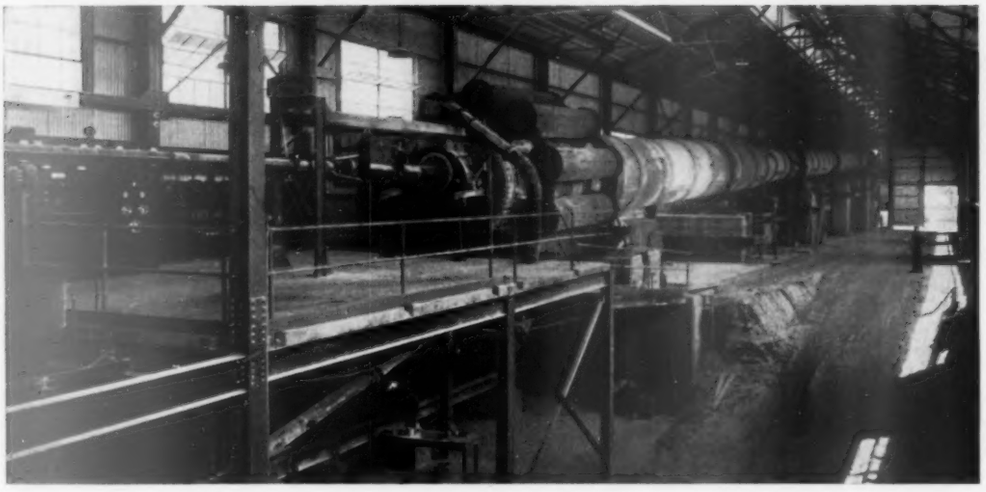
THE Pine Hill Lime & Stone Co. at Pine Hill, Ky., operates a property which has had a long and varied history as a source of nonmetallic minerals. Coal was mined there for many years before the L. & N. Rwy. in 1900 opened a mine at what was then the terminus of one of its branches. In 1912 a small plant was built for the production of quicklime. A hydrator was added in 1922 and a crushed-stone department in 1932. In 1936 roll and gyratory crushers were installed for the production of pulverized quicklime. The company then obtained the rights for the manufacture of Blank Process masonry cement for the state of Kentucky and early in 1938 completed the installation of equipment for the manufacture of this product. Formerly known as the Rock Castle Lime & Cement Co., the present company took over the operations in 1929.

Coal is no longer mined commercially but is used in the kilns and plant. Also on the property is clay suitable for the manufacture of building brick, and fire clay for the manufacture of fire brick. Pottery clay has also been produced in past years. All the ingredients necessary for the manufacture of Portland cement are also available.

Originally the limestone was obtained by open-quarrying methods. In 1922 a mine was opened but a cave-in in 1933 caused its temporary abandonment. In 1935 the mine was reopened and all the raw materials used for lime and masonry-cement manufacture are now obtained from it. Stone was originally loaded by hand into 1¾-cu.yd. cars which rolled to the plant by gravity and were pushed back by man power. Later dump trucks were added. In 1936 the cars were replaced with two Dempster Dumpster units each serving three 1½-cu.yd. buckets. These are carried on International trucks. Formerly three dump trucks with 12 men loading them and 5 cars with 10 men loading were kept busy supplying the plant chiefly from the open quarry. Most of the materials are now obtained from the mine at a greater distance. The two Dumpsters with 12 men loading the buckets supply as much or more stone to the plant.

The deposit consists of a 6-in. layer of shale under which is from 5 to 6 ft.

# UNAX ROTARY KILNS FOR LIME BURNING



The advantages of the Unax Rotary Kiln are:

Low fuel consumption.

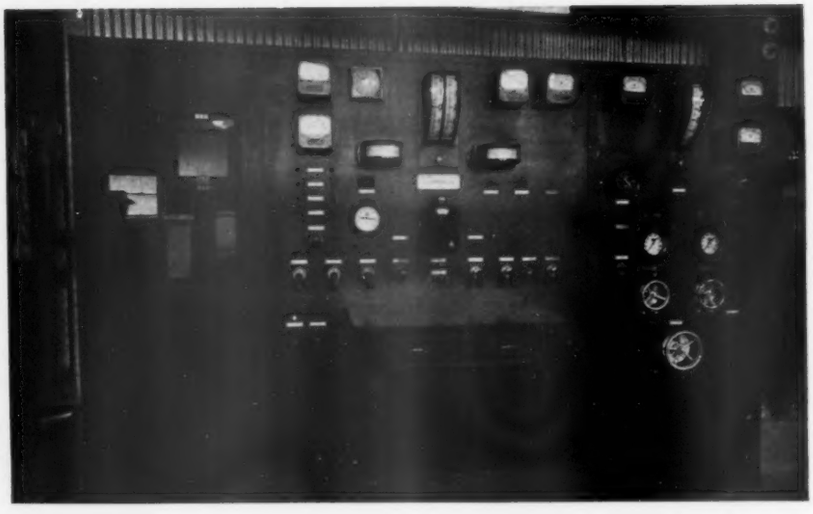
Reduced cost of production.

Better quality and greater uniformity of product.

● **The Kiln illustrated is installed in the lime plant of H. E. Millard, Annville, Penna.**

THE modern, efficient **Unax Rotary Kiln** for calcining lime is the result of our many years experience in manufacturing and engineering hundreds of rotary kilns in such industries as cement, ore, lime, chemical, etc.

The **Unax Cooler** is integral with the kiln and provides efficient cooling of the calcined material by means of the air for combustion which thereby becomes pre-heated to a high degree.



The **FLS Centralized Kiln Control** concentrates at one convenient point the control switches of the kiln and auxiliary equipment, sequence interlocks, alarms, signals, and instruments showing speeds, draft, temperatures, etc., constantly presenting to the kiln operator a clear, quick picture of the kiln's operation.

The **FLS Gas Analyzer permits** obtaining complete combustion of the fuel while avoiding excess air in the kiln.

F. L. Smidth & Co. are manufacturers of Rotary Kilns, Coolers, Grinding Machinery and auxiliary apparatus, and in addition are Engineer Specialists in designing and equipping plants employing such machinery.

**F. L. SMIDTH & CO.**

225 BROADWAY — Engineers — NEW YORK, N. Y.

Bucket-load of stone being dumped into car feeding the lime kilns.

of a shale-and-limestone mixture. Below this is about 30 ft. of good limestone, of which only the top 20 ft. is now being mined. In developing the mine the shale and mixed materials are first blasted out to a depth of about 12 ft. by means of horizontally-drilled holes. After this material is cleaned out holes are drilled vertically through the limestone to the floor level. Ingersoll-Rand Jackhamers and Austin LDX slow-breaking exposives are used. Compressed air is furnished by a 14-in. by 14-in. by 12-in. Ingersoll-Rand FRI steam-driven compressor.

The mine has been worked to a depth of 700 ft. by the room-and-pillar system. Work is usually going on at about ten different points in the mine so that loading operations are never delayed by drilling or blasting. The types of stone used for making lime and crushed stone are hand-picked into separate buckets. Two men load each bucket and on piece work they average about 3 tons per hr. each. Some of the shale is used in the Blank Process but most of it is obtained from a pit outside the mine. Some rock is also quarried occasionally, usually during hot and humid weather, when it rains a fine foggy spray inside the mine, making it uncomfortable to work there. The mine temperature is from 68 to 72 deg. the year around, and the ventilation is so good that neither the blasting nor the trucks make conditions uncomfortable.

The stone for the kilns is dumped on a 10-in. rail grizzly, through which large pieces are sledged. The stone drops into a car which is hauled to the top of the kilns by a hoist.

The five kilns have steel shells and are 60 ft. in total height with an inside diameter of 6 ft. They are fired with coal through fire-boxes on each side. A 3-to-1 fuel ratio is obtained. Each kiln has a cooling cone from which the lime is drawn every 6 hr. through shear gates. A ¾-ton buggy is used to dump the lime on the floor alongside a pan conveyor.

When sufficiently cooled the lime is picked and loaded on the pan conveyor. It is then discharged over a 2½-in. sloping bar grizzly. Material passing through the grizzly goes into a Sturtevant rotary crusher and the oversize goes to a Pennsylvania single-slugger roll crusher. An elevator feeds the products of both crushers to a Stephens-Adamson slotted, self-cleaning stationary screen. The oversize from this screen is returned to the crushers and the throughs go into a 300-ton steel storage tank. The oversize can also be loaded out as pebble lime.

A screw-conveyor feeds the quicklime from this tank to a bucket-elevator, which discharges it into a 15-ton hydrator feed bin. A screw-feeder driven through a Link-Belt P.I.V. variable-speed reducer can feed it from this bin either into a 1-ton Clyde hydrator or into the masonry-cement system. The hydrated lime goes to a Raymond beater mill, from which the beaters have been removed, so it now serves only as a separator. After going through a cyclone the hydrated lime is discharged into a bin over a 2-tube packer.

Both masons' and chemical lime are made with this system. Agricultural lime is made by adding 20 per cent. of pulverized limestone to the hydrate leaving the Clyde hydrator.

The shale used in the manufacture of Blank Process cement is discharged over a separate rail grizzly into a 60-ton bin. A belt-feeder serves a Jeffrey hammer-mill into which quicklime is also discharged from the variable-speed screw-feeder previously described. The hammer-mill pulverizes and mixes the

Looking down on the roll-crusher and the gyratory beneath the grizzly.

shale and lime. A bucket-elevator discharges the mixture into a 12-in. by 48-ft. hydrating screw-conveyor. Water added at several points near the feed end of this screw hydrates the lime in the presence of siliceous material causing a reaction due to the heat and moisture.

The hydrating screw discharges its product into an F. L. Smidth 5½-ft. by 20-ft. tube-mill. A partition was put in this mill 5 ft. from the feed end. The first compartment is loaded with

The hammer-mill used for secondary reduction of stone.

2½-in. steel balls and the second compartment with ⅞-in. balls. A small percentage of Portland cement is added to the feed. The tube-mill product is elevated into a 400-ton storage tank or a bin over the baggers previously mentioned. A screw-conveyor reclaims the cement from the tank to this elevator.

The kilns have a capacity of 45 to 50 tons in 24 hr. and the hydrating capacity is 30 tons in 10 hr. The capacity of Blank Process cement is 35 bbl. per hr. According to Howard N. Egan, vice-president and superintendent, this product is rapidly gaining in popularity and is a profitable addition to the company's line.

This masonry cement exceeds A.S.T.M. specifications, which call for a strength of 175 lb. at 7 days. Tests made continually by the University of Kentucky show an average strength of from 240 to 250 lb. per sq. in. The workability and plasticity test results are also high and the shrinkage low.

An 18-in. by 18-in. steam engine drives much of the stone-plant equipment through belts and drives a 125-kw. d.-c. generator for motors operating other equipment. Another steam engine operates the lime plant equipment and a third engine operates the hoist. Electric power for lights and for arc-welding is purchased.

Stone for the crushing plant is dumped from the buckets into a No. 7½ Austin gyratory crusher. A bucket-elevator lifts the crusher product to a 5-ft. by 20-ft. Link-Belt revolving screen, whose oversize output is discharged to a Telsmith 2F gyratory crusher with a smooth head. The product of this crusher is discharged to the elevator. Any of the various sizes of stone produced by the screen can be discharged into a Universal Crusher Co. hammer-mill, which also feeds back to the elevator. The fine product of the revolving screen (minus ¼-in.) together with that produced by the hammer-mill is discharged on a 4-ft. by 8-ft. vibrating screen with ⅛-in. cloth. This produces chats and agricultural stone.

# HARDINGE

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ROD MILLS
TUBE MILLS
THICKENERS
COUNTER CURRENT CLASSIFIERS
CONSTANT WEIGHT FEEDERS
AGITATORS
DIAPHRAGM PUMPS
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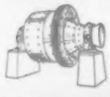
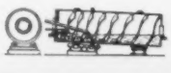
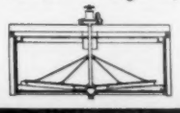




CONICAL MILLS | COUNTER CURRENT CLASSIFIERS | THICKENERS CLARIFIERS | RUGGLES-COLES DRYERS | CONSTANT WEIGHT FEEDERS | TUBE ROD AND BATCH MILLS

# LIME QUARRY USES DETACHABLE BUCKETS

IN an effort to reduce production costs at its plant at Reddick, Fla., 13 mi. north of Ocala, the Dixie Lime Products Co. of that city in January of this year purchased the latest Model LF Dempster Dumpster with three 2-cu.yd. buckets. This is mounted on a Ford truck chassis. The stone is being hauled about ¼ mi. to the plant and with 3 men loading two of the buckets while the third is in transit enough stone for 24-hr. operation of the kilns is easily handled in 8 hr. This system gives the men an 8-hr. day but results in some waiting time for the truck. According to Supt. W. T. Alsop, two men to each bucket would keep the truck busy but enough material for the plant's entire daily capacity would be made available in only 5 hr.

Connecting up a loaded bucket to be hauled to the lime plant.

For about ten years previously two dump trucks had been used to haul stone from the quarry. According to Mr. Alsop, this method caused a loss of time for the trucks while loading and the men also sometimes waited for the trucks. The Dumpster, he said, has effected a saving of over 20 per cent. in loading and hauling costs. If operated at peak efficiency, even greater savings would be shown.

Empty bucket being placed in position while another is being loaded.

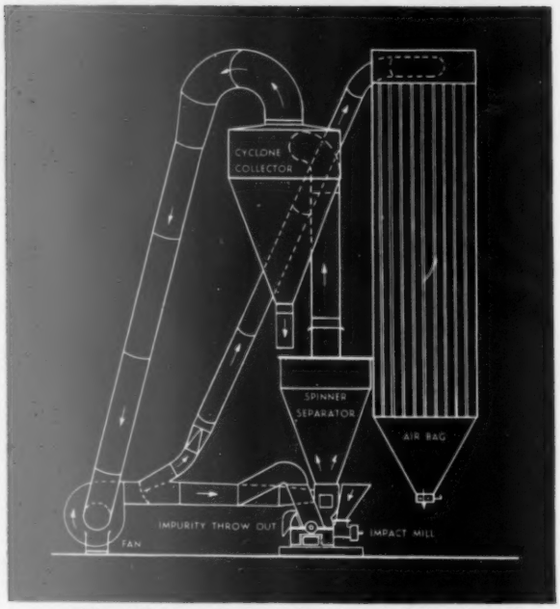
The rock at this location is Ocala

Shovel loading fine material in the quarry to waiting trucks.. One of the detachable buckets with a load of kiln-size stone may also be seen.

General view of the lime plant showing some of the kilns.

Bucket load of stone being discharged into car on incline to lime kilns.

## BETTER PULVERIZERS AND AIR SEPARATORS FOR THE LIME INDUSTRY

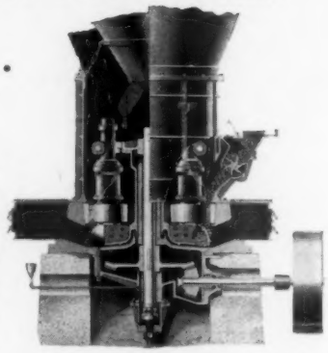



### WILLIAMS BEATER MILL WITH SPINNER SEPARATOR AND CORE THROWOUT for HYDRATED LIME

Actual grinding is accomplished by the well known Williams Hammer Principal. The Air Separator extracts material of the desired size and returns the oversize to the mill for regrinding. Cores rejected by the mill are unusually clean and hydrate can be ground as fine as 99.9% through 325 mesh. There is a throwout at the back of the mill which throws out the unburned cores and stone, assuring a hydrated lime of exceptional chemical purity. Extreme efficiency of the throwout reduces to a minimum the rejection of pure lime. Also grinds burned lime.

### ROLLER MILL WITH SPINNER AIR SEPARATOR for BURNED LIME . . .

**Finenesses up to 325 mesh**



The Williams Roller Mill with the Spinner type Air Separator is the ideal equipment for grinding burned lime. No chance to clog the Spinner Separator. Impurities can be spouted out of the system or ground to the same fineness as the lime. Nine popular sizes.

**The Williams Patent Crusher & Pulverizer Co.**
**802 St. Louis Ave. St. Louis, Mo.**
**Sales Agencies in All Principal Cities**

Williams
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
PATENT CRUSHERS GRINDERS SHREDDERS

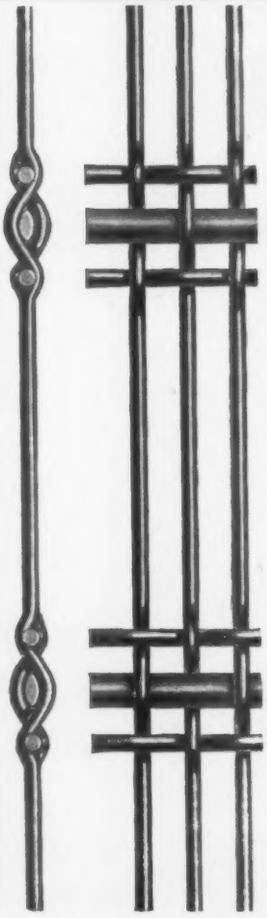
**WE ALSO BUILD HAMMER CRUSHERS AND SINGLE ROLL CRUSHERS . . . WRITE FOR BULLETINS**

## KUNTZ SYSTEM

Efficiency in lime burning and lime hydrating is seldom attained by ordinary operating methods or without skilful design and engineering. KUNTZ-designed and engineered lime and hydrate plants are recognized the world over as the basic equipment for reducing limestone to lime and allied products. Complete control insures uniform quality . . . minimum power requirements assure lowest cost per ton produced. More and more, experienced operators are coming to rely on the KUNTZ SYSTEM in revamping existing works as well as when planning new construction.

Arrange for a preliminary study of your plant—with recommendations—NOW!

**LIME & HYDRATE PLANTS CO.**
Box 574
York, Pa.



## STA-TRU
### Long-Mesh Woven Wire Screens

made to work under tension and vibration.

The straight stay - bars carry ALL the tension. The crimps in the round wires can not be stretched or broken. The screen can not be caused to sag or split by the pull of the tensioning device.

**LUDLOW-SAYLOR**
**WIRE CO. ST. LOUIS**

limestone, which averages about 99 per cent. $CaCO_3$. The deposit is about 40 ft. deep above ground-water level and in this quarry the face averages 35 ft. in height. Snake-hole shots are made, using hand drills and augers. Some Kel-Bar explosive has been used.

In January a new Bucyrus-Erie 10-B convertible gasoline shovel, clam-shell and drag-line was purchased. This is used for utility work both at this quarry and at the company's road-rock plant at Kendrick, Fla., a few miles north of Ocala. At present this shovel is loading rock too small for the kilns into trucks in the quarry. These trucks haul this material either to stock-piles or to the road-rock plant at Kendrick.

The kiln rock is discharged at the lime plant into a 2-cu.yd. car, which is hauled by a hoist up an incline to the feed track over the kilns. The 9 stone kilns are 22 ft. high and 6 ft. in diameter inside. They are wood-fired, and together have a capacity of 40 tons of quicklime in 24 hr. The lime is drawn and picked before it is crushed in a single-corrugated-roll crusher. A revolving screen discharges the pebble lime into a bin, from which it is put into bags or drums, or (in bulk) into cars.

**The beater mill with double whizzer in the lime plant.**

A Jeffrey hammer-mill pulverizes the quicklime passing through the screen. This material is fed from a bin into the 1-ton Clyde batch hydrator which can hydrate 3 batches per hr. The hydrated lime is fed to a Raymond beater mill equipped with a double Whizzer separator. This material is sacked for shipment by a 3-spout packer.

# Gravity Cleaning of Aggregate

**By F. N. BENDELARI**

Gravity separation, which is highly developed and extensively used in metallurgical work, is used in the preparation of some nonmetallics to remove gangue and heavy impurities and presents economic possibilities in the preparation of a wider range of nonmetallics and of sand and gravel for aggregates. The same principles used by the metallurgist in concentrating minerals—separating the heavy particles from the light ones by the use of jigs—have been successfully applied in the concentration of fluorspar, barite and other nonmetallics, and in the beneficiation of gravel and sand for concrete aggregate. All the lighter material that rises to the surface in pouring and tamping, including shale, shell, coal, lignite, light porous stone, light soft stone and water-logged wood, are rejected on a jig with little loss of good gravel or sand.

Some of the gravels in which the shales are associated with iron oxide contain particles of shale as heavy as the good gravel and these heavy particles can not be separated on a jig, but at gravel pits in Iowa, where some iron oxide was present in the shale, excellent results were obtained.

Float and sink tests of gravel and sand samples in heavy solutions predetermine the suitability of the proposed material for gravity separation.

Gravel or sand treated on jigs is also very thoroughly washed and effectively freed from slimes.

Jigging is an inexpensive process, 5 hp. being required to treat 500 tons of gravel or 300 tons of sand (⅜-in.) in 24 hr. Two hundred and fifty gal. per min. is required for pulsion water which can be impounded and used over again if necessary. One operator can attend several jigs.

Many deposits of sand and gravel, which will not yield permissible aggregate by ordinary treatment, can be successfully treated on jigs.

A screen with 1-in. square openings is used ahead of the jigs and if a larger proportion of 1-in. material is required, a portion of the oversize is sent to a crusher and returned to the jigs.

## Growing Use Found for Talc in Wall Tile

The leading new development in the talc industry is its growing use in wall tile and other ceramic bodies, for which purpose New York and Canadian talcs have found favor, according to Paul M. Tyler, of the Bureau of Mines. Lime-free talcs are wanted for use in highly absorptive bodies used for electrical heater plates where minimum thermal expansion and resistance to heat shock are desired; but for the porcelain, and particularly for bodies maturing at low temperature, talcs containing definite amounts of lime are desired. A beneficiated material, especially a froth-flotation product, is considered best, this treatment in such case being directed not so much to eliminating lime as to assuring uniformity of analysis.

## Industrial Sands of Importance in Indiana

The molding-sand and glass-sand resources of Indiana are described in a two-page report entitled "Sands," published in November 1938 as part of Series I of reports on the Mineral Resources of Indiana. The report directs attention to the fact that glass and foundry sands are of prime importance.

Foundry sands are widely distributed in Indiana; 36 counties have some workable deposits. Of this number, about a dozen counties have considerable quantities available. In recent years 24 companies have produced foundry sands.

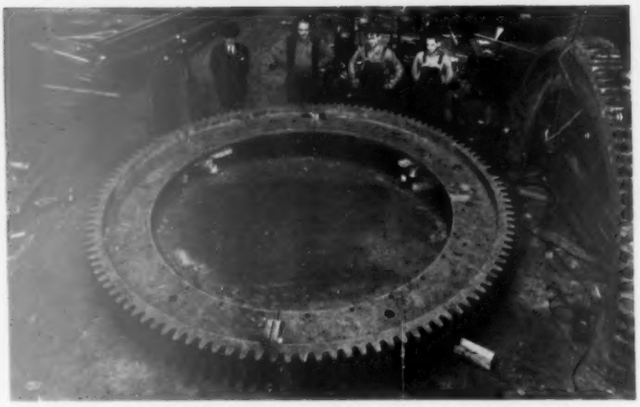
Glass sand also is plentiful in several areas, of which the largest is a strip of almost pure white sand in the dune area bordering Lake Michigan in three counties. The area ranges in width from 1 to 1½ mi., covers about 100 acres, and is from 50 to 190 ft. high. Another dune, south of the Kankakee River, extends about 2,000 sq. mi. Half a dozen other counties have sand that has been used in glass manufacture. One of the purest of the glass sands occurs in White County, where it contains from 99.79 to 99.99 per cent. silica, 0.008 per cent. alumina, a trace to 0.24 per cent. iron oxide, and no lime.

## Church Congregation Sues Cement Company

The suit of the St. John's Evangelical Lutheran Congregation, Nazareth, Pa., against the Lone Star Cement Co., originally filed in the Northampton County courts, has been transferred to the Federal court.

The congregation seeks to collect $35,000 for damages alleged to have been sustained by the church by blasting on the Lone Star Cement Co. property nearby.

# Dolite Co. Saves Time and Money in an Emergency



The gear assembled for service. Flame cutting of steel plate on a template and expert welding did the trick.

When the old ring gear on the 9½ by 150 ft. rotary kiln at the Dolite Co. plant stripped, they needed a new one in a hurry. But they couldn't afford to wait 10 or 12 weeks for a new one to be cast, machined and shipped. So they called on us . . . with the result shown in the accompanying photographs. *Eleven days after the breakdown occurred the kiln again went into service!* Not only did we save this concern many weeks of production delay but the new flame-cut, welded gear actually cost less, is stronger and will give longer service than could be attained by any other method.

Close-up of the ring gear after fabrication. Note uniformity of the teeth . . . even better than could be obtained with cast steel.

Read the complete story of this job on another page of this issue. And, when you face a similar problem, get in touch with us at once. Find out what Manufacturer's Steel Supply Co. service and skill can mean to you, either for routine repairs or in an emergency.

**MANUFACTURER'S STEEL SUPPLY CO.**
**TOLEDO . . . . . OHIO**

# *80,000 Yards* of GYPSUM ROCK MOVED

## *. . . Performance: Practically Perfect*

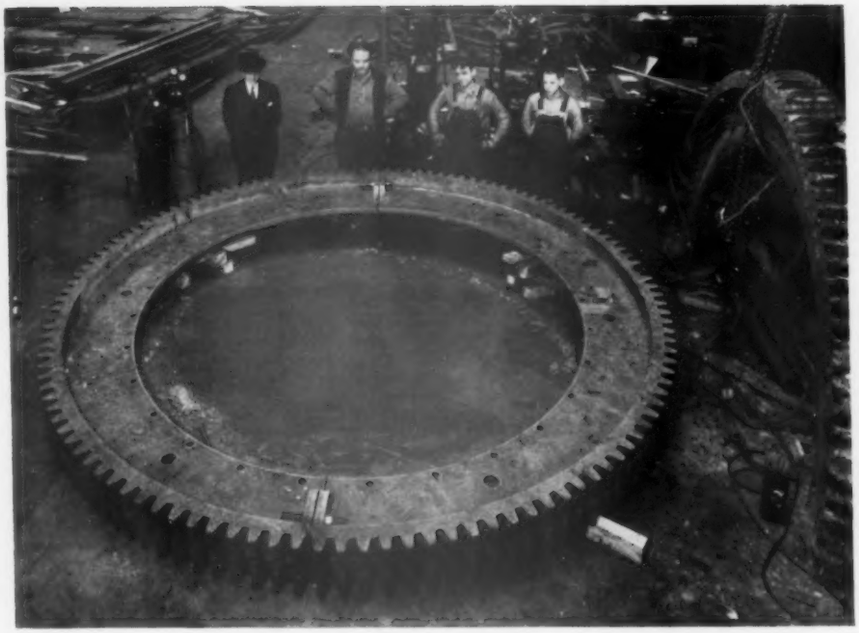
## THAT'S WHY THE CONTRACTORS PREFER GARDNER-DENVER

● On this road job in south central Kansas—Stamey & Tidd, Contractors—the Gardner-Denver UMB Wagon Drill and Portable Air Compressor shown in photograph have moved nearly 80,000 yards of gypsum rock, working on 24-hour service. The compressor has operated the entire time without a forced shutdown, and with no replacement parts needed. The UMB drill has needed replacement only of a broken exhaust control valve spring. "We're pleased," says Mr. Stamey, who is in charge of the job, adding that he also uses Gardner-Denver S-35 Sinking Drills for block-holing.

*Another aid to fast, economical work—the Gardner-Denver WDS Wagon Drill. Drills holes in practically any position..12-ft. steel changes.*

Take no chances with your profits on rock work—use Gardner-Denver equipment with its *proved record* of getting results. Gardner-Denver equipment is a PAYING investment. Learn all the facts—write today for bulletins. Gardner-Denver Company, Quincy, Illinois.

**GARDNER-DENVER** 80th ANNIVERSARY YEAR



Looking down on the rotary-kiln gear after assembly for service at the Dolite plant. At the extreme right the old gear which was stripped may be seen.

# Ring Gear for Kiln Fabricated by Flame-Cutting and Welding

THE 150-ft. rotary kiln at the Gibsonburg, O., plant of the Dolite Co., Toledo, O., is 9½ ft. in diameter and was originally equipped with a cast-iron ring gear. The teeth had worn quite thin and one day recently, while starting the kiln, the teeth were stripped. There was no spare gear on hand and replacement for the driven member with the least possible delay presented quite a problem.

The result of conferences between Dolite Co. officials and the Manufacturer's Steel Supply Co. of Toledo was the flame-cut welded construction shown in the two accompanying illustrations. Not only was the cost of the new gear less than one made from cast steel but the replacement was made in 8 days compared with the 10 or 12 weeks which would be required in obtaining delivery from the foundry. Actually, from the time the breakdown occurred until the kiln again went into service, only 11 days elapsed!

The most significant items are the component parts of the gear and the flame-cutting of the teeth. And, as the illustrations show, the teeth themselves are remarkably uniform in size and smoothness.

Each component part had been cut on a template. The center rim was made of 1¾-in. plate and the side sections of the gear teeth were cut from a 5-in. plate. While it might be possible sometime to cut a homogeneous section 11¾ in. in thickness, at the present time it was felt that the lag of the acetylene flame at the far side of the burning surface would cause unevenness.

The lag of the flame in cutting a 5-in. plate naturally was comparatively small and good assembling of the complete gear was achieved. In fact, after the assembly, the radius was held within 3/32 in. This is less than the anticipated metal warp of such a large casting.

The weight of the gear as shown was 11,300 lb. and no machining whatever was required with the exception of drilling the bolt holes in the rim.

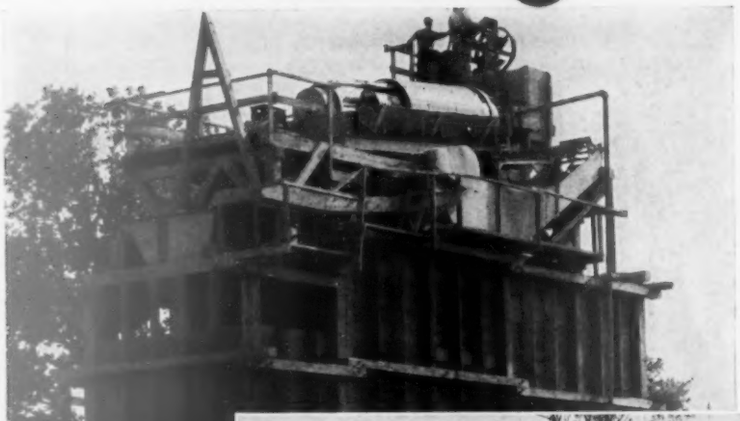
A close-up view of the ring gear fabricated by cutting and welding.

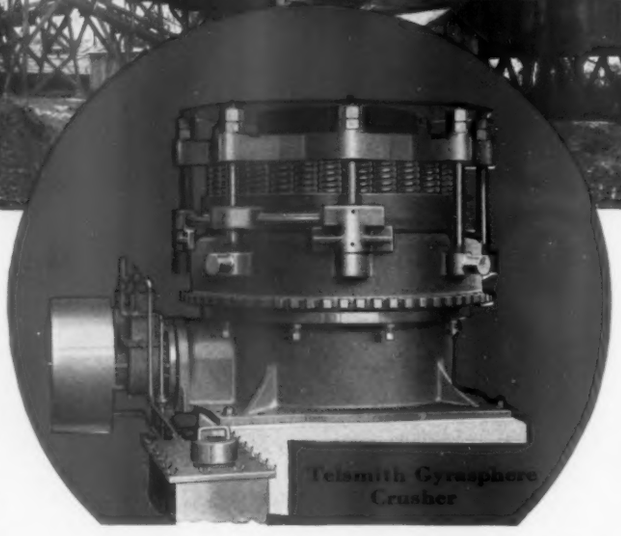
## Concrete-Truck Drivers Win Safety Certificates

At a general meeting of the employees of the General Material Co., ready-mixed concrete producer at St. Louis, Mo., held on April 1, certificates were awarded to 38 regular drivers who had no accidents during 1938. Special certificates and cash awards were also presented to three drivers who had no truck accidents during continuous employment by the company for ten years.

Among the company's regular drivers on ready-mixed-concrete trucks are also two men with no-accident records for nine years, and three men for eight years. At the meeting, it was also announced that no lost-time personal injuries had been experienced for the preceding 187 days. A representative of the St. Louis Safety Council commended the company's drivers for their excellent showing in safe-driving and also prevention of personal-injury accidents.

# Crushing Gravel at 3¢ PER TON






Yes, sir—*three cents per ton* to crush gravel. That's what the records of the Valley Sand & Gravel Co. show it costs to operate their No. 36 Telsmith Gyrasphere. This includes power, lubrication and maintenance, but not depreciation. Of this 3-cents-a-ton cost, only 1-3/10 cents goes for maintenance, which includes lubrication, repair parts and manganese liners installed.

"These costs are much lower than for any other crusher I have ever operated," says the plant superintendent, Mason Schoolfield.

Crushing very hard abrasive gravel from 4½" round to 1¼" square openings, output is 60-70 tons hourly, but "factors outside the crusher held production down," says Mr. Schoolfield.

Located at Port Republic, Va., this plant is owned and operated by N. A. Coulter and C. P. Brown. It was especially installed to produce 100,000 tons of sand and gravel for the construction of a huge rayon factory near Front Royal, Va.

In addition to the No. 36 Telsmith Gyrasphere Crusher, it is equipped with a 20" x 5' Telsmith Plate Feeder; two Telsmith Belt Conveyors, 24" x 77' and 20" x 54'; No. 6 Telsmith Belt Elevator, 42' long; 40" x 16' Telsmith-Ajax Washing Screen; 30" x 16' Telsmith Sand Drag; No. 7 Telsmith Sand Settling Tank; and five Telsmith Bin Gates.

Whether you are modernizing or want a complete new sand-gravel or quarry plant, *write for Bulletin E-15.* GC-4-39

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Cable Addresses: Sengworks, Milwaukee—Concrete, London
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Brandeis M. & S. Co.
Louisville, Ky.

# TELSMITH

## Lubrication (from p. 32)

The real carbon portion of so-called carbon deposits depends on the "make-up" of the oil, as well as on the amount fed to the cylinder. If a blended oil, consisting of cylinder stock and a comparatively light-bodied distillate, is used, the tendency is for the distillate to vaporize, leaving the heavy-bodied cylinder stock as a residue to oxidize and act as a binding agent for air impurities, etc. Such an oil may have the correct viscosity but its flash-point would be low and not consistent with its viscosity.

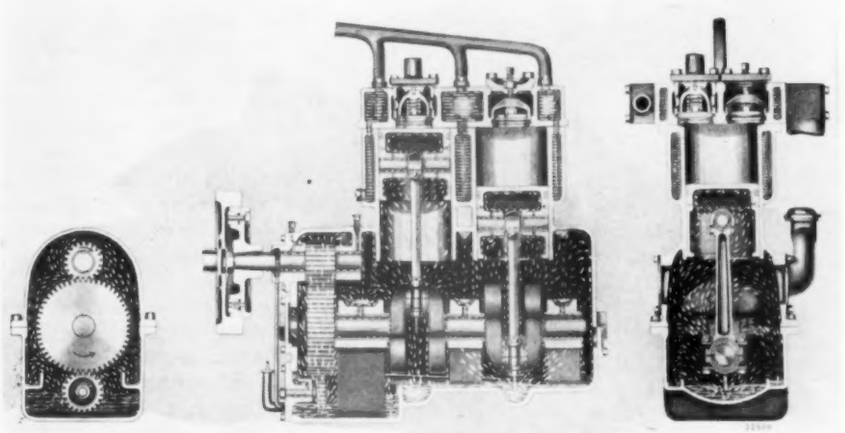

Fig. 6—Section of portable compressor showing operation of "constant-level" lubrication system.

It is common practice to use motor oils for lubricating many of the small portable compressors. Most motor oils are blends of distillates and bright stock which is a refined cylinder stock. For the reason stated above motor oils are not in general considered good compressor oils.

*Fire- and Flash-Points.*—It is common practice to overemphasize the importance of the flash- and fire-points of compressor oils. Many believe erroneously that a high flash-point is indicative of high quality, low oil consumption, and a security of freedom from fires and explosions. It is generally true, in comparing oils of the same viscosity, that the one having the highest flash-point will evaporate less, hence deposit less carbon. Consumption, however, is chiefly caused by the air and piston scoring the oil from the cylinder walls and its ultimate ejection in atomized form with the discharge air. The flash-point bears no relation whatever to this action of the air and piston. Viscosity is mainly the governing factor. Regardless of statements to the contrary, the flash-point is of relatively little importance in so far as explosions and fires are concerned.

*Pour-Point.*—Where compressors are exposed to low-temperatures, the oil should have a pour-point sufficiently low to avoid any possibility of failure to flow in the lubricator. The pour-point should be at least as low as the lowest temperature encountered in operation.

*Compounded Oils.*—Air is never dry. It always contains some moisture which is never deposited in the cylinder of single-stage compressors or in the first-stage cylinder of multi-stage machines. In two-stage and other multi-stage compressors moisture is deposited in the intercooler, when the air is cooled below its dew-point. In these machines some moisture is still entrained in the air and is carried into the next stage.

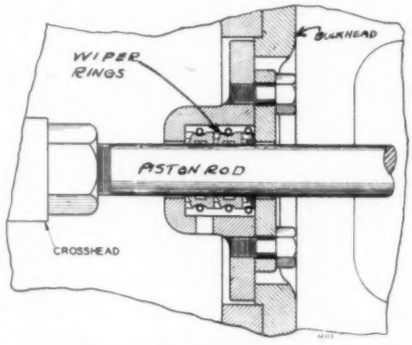


Fig. 7—Piston-rod oil-wiper bulkhead and rings.

This air-moisture mixture enters the cylinder at high velocity and tends to wash the oil films from the interior surfaces. To resist this washing effect slightly compounded oils are generally recommended for the high-pressure stages of multi-stage compressors. Compounded oils form emulsions with water and are more adhesive in the presence of water than straight mineral oils.

The fixed oils used for compounding are more easily oxidized than straight mineral oils. The percentage of compound should therefore be just sufficient to counteract the moisture and no more, and should not be used unless necessary. Usually 1 per cent. of compound is sufficient. Lard or tallow oils are preferred to rape-seed oil, which is more prone to oxidize.

*Fires and Explosions.*—Contrary to a generally-accepted opinion, the characteristics of the oil have very little to do with air-compressor fires and explosions. Most authorities believe that some faulty condition of operation or installation must exist before fires and explosions can occur. When such conditions do exist and fires or explosions take place, it is always found that the operating temperatures have exceeded the flash-point of any oil.

Reports of investigations of explosions show that in most cases the flash-points of the oils ranged from 500 to 600 deg. F. In Diesel engines some of the most successful oils do not have flash-points above 450 deg. F., yet the temperatures involved may be as high as 1,000 deg. F., thus proving that high-flash-point oils are not required.

The temperature at which oil-air vapor ignites spontaneously is higher the lower the viscosity of the oil. In general, the more complex and the more viscous an oil is the lower is its spontaneous-ignition temperatures. Kerosene, for example, ignites spontaneously in air at a lower temperature than gasoline. For this reason the compression ratio of kerosene engines is lower than that of gasoline engines.

*Methods of Oiling External Parts.*—Oil is generally supplied to the external parts of air-compressors by one or a combination of two of the following methods: (1) Splash oiling, (2) gravity-circulation oiling, (3) force-circulation oiling, (4) ring and chain oiling, or (5) drop-feed and wick-feed.

Splash oiling is employed for the complete lubrication of all parts of many small and medium-size, single-acting compressors. It is also used for the lubrication of the external parts only of many double-acting compressors, the internal parts of which are supplied by means of mechanical force-feed lubricators or sight drop-feed oilers.

Because the crankcase of splash-lubricated compressors serves as an oil reservoir, it is closed with the exception of a breather pipe. The cylinder and crankcase of compressors utilizing splash lubrication for the external parts only are usually separated by a bulkhead equipped with oil-wiper rings (Fig. 7) which prevent the crankcase oil from working along the piston rod into the cylinder.

In the gravity-circulation system the oil is pumped from a bottom reservoir or sump to an overhead tank, from which it flows by gravity through pipes provided with adjustable feed valves to all the parts. The feeds are generally so reduced as to provide drops only.

In the force-circulation system a flood of oil is pumped under pressure direct from the reservoir to all the parts. A flood of oil, therefore, is supplied to all the parts continuously, thus lubricating and cooling them.

Ring and chain oiling are sometimes used on the main bearings of some compressors, while drop-feed and wick-feed oiling are generally restricted to small parts that are not subjected to severe operating conditions.

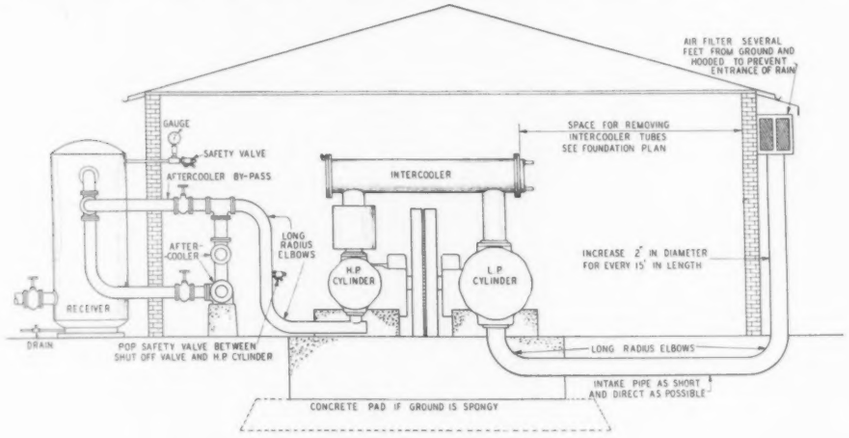
AIR FILTER SEVERAL FEET FROM GROUND AND HOODED TO PREVENT ENTRANCE OF RAIN
GAUGE
SAFETY VALVE
AFTERCOOLER BY-PASS
INTERCOOLER
SPACE FOR REMOVING INTERCOOLER TUBES SEE FOUNDATION PLAN
AFTER-COOLER
LONG RADIUS ELBOWS
H.P. CYLINDER
L.P. CYLINDER
INCREASE 2" IN DIAMETER FOR EVERY 15' IN LENGTH
RECEIVER
DRAIN
POP SAFETY VALVE BETWEEN SHUT OFF VALVE AND H.P. CYLINDER
LONG RADIUS ELBOWS
INTAKE PIPE AS SHORT AND DIRECT AS POSSIBLE
CONCRETE PAD IF GROUND IS SPONGY

**Fig. 8—Illustrating the correct installation of a compressor.**

*Characteristics of Oils for External Parts.*—Because they are used over and over continuously, oils used in splash, circulation, ring, and chain oiling systems must possess (1) correct viscosity, (2) high resistance to oxidation, (3) high resistance to emulsification, and (4) a pour-point below the minimum temperature likely to be encountered in service.

Oils used in drop-feed and wick-feed systems are not subjected to these severe operating conditions. In these systems the oil is used but once and passes quickly through the bearings. There is no agitation or churning of the oil, and it seldom comes into contact with water. Consequently, it need not be highly resistant to oxidation and emulsification.

In many single-acting compressors the same oil is used for lubricating both the internal and external parts, while in others of this type separate oiling systems are used. When the same oil is used for both the external and internal parts, the viscosity required to provide an adequate piston seal is the governing factor. This viscosity is slightly higher than necessary for the bearings, but it is necessary to compromise in favor of the cylinder.

When separate systems are used, a medium-heavy viscosity oil is recommended. If the system is of the force-circulation type, a slightly lower viscosity oil may be used.

In compressor crankcases constant agitation of the oil over long periods of time is particularly conducive to oil oxidation. If an oil of poor quality is used, the products of oxidation combine with foreign materials to form sludge, which may clog the oil strainers, ducts, pipes, etc.

Water sometimes enters the crankcase of a compressor and when churned with the oil a thick emulsion is formed. This tends to clog the pump screen, oil-ducts, pipes, and drains. The oil, therefore, should have a high demulsibility value in order that water may have the least possible effect on it.

*Summary.*—In brief, successful air-compressor operation is assured by observing the following rules:

1. Install compressor properly (Fig. 8).
2. Use as clean and as cool air as can be provided.
3. Use adequate cooling water and as cold and as soft as can be provided.
4. Operate the compressor in the service for which it was designed.
5. Periodically inspect the water jacket, valves, discharge pipe, after cooler, intercoolers, and receiver.
6. Take the temperatures of the intake and discharge air periodically.
7. Use a suitable viscosity, high-quality oil and feed a sparing amount at a uniform rate.
8. Clean the cylinders weekly by feeding for 2 or 3 hr. a soap-water solution of 1 part soft soap and 15 parts of water into the cylinder instead of the oil. The feed should be about ten times as great as that of the oil. After using this solution all drain cocks should be opened to remove any accumulated soap-water solution. Then feed oil to cylinder for at least ½ hr. before closing down the compressor. Kerosene, gasoline, or benzene should not be used for cleaning air-compressor cylinders.
9. Install an aftercooler.
10. Install receiver.

## U. S. Produces But 5% of Asbestos Consumed

The United States is the largest asbestos-consuming country in the world but produces only a small fraction of its requirements of raw materials. In 1938 domestic sales amounted to only 5½ per cent. in quantity and 4 per cent. in value of domestic requirements. How could our needs be met in an emergency? Stimulation of domestic production bears little promise. Although many occurrences of chrysotile asbestos have been found in the United States, few of them seem to have commercial possibilities. Arizona deposits furnish excellent crude fiber but mining costs are high, transportation is difficult, and freight rates to eastern markets are excessive. Vermont deposits are extensive and could produce large quantities of mill fibers of moderate to short lengths, but they furnish little fiber of spinning grade. Chrysotile deposits are known in California and some other states, but none appear to be capable of development into consistent producers of a large tonnage of spinning fiber.

The possibility of making synthetic asbestos to take the place of the natural fiber has been suggested, but due to certain special qualities for high-grade asbestos that man can not duplicate in a laboratory, the manufacture of synthetic asbestos seems to be farther from attainment than the manufacture of synthetic diamonds. The United States evidently must continue to depend on foreign supplies.

Production of asbestos in the United States in 1938 amounted to 12,901 short tons compared with 13,896 tons in 1937, a decrease of 7 per cent. The quantity sold or used by producers in 1938 (10,440 tons valued at $247,264) decreased 14 per cent. in quantity and 28 per cent. in value. The decrease in value is probably due chiefly to increased sales of Arizona short fibers. Stocks in the hands of producers as of December 31, 1938 were higher than in 1937.

Chrysotile was produced in Arizona and Vermont and amphibole (tremolite) in Maryland. Plans are being made to resume operations at the Morgan Asbestos mine in Placer County, California, and also for developing a property 9 mi. from Glenrock, Converse County, Wyo. It has been reported to the Bureau of Mines that the Karstolite Co. no longer operates the anthophyllite deposit in Gallatin County, Montana, but a new company, the Montana Asbestos Co., is in process of organization.

Vermont prices were constant throughout the year as follows: shingle stock, $57; paper stock, $40; cement stock, $25; shorts and floats, $12-$18.

By Z. H. MISCHKA

# State Wage-and-Hour Measures Fail to Gain Passage in Most Instances

LEGISLATURES of approximately half of the union's 48 states continued in session during April, grinding out legislation touching upon a wide variety of subjects affecting the pit and quarry industries.

While a number of sessions were nearing adjournment, others had hardly more than started serious study of the hundreds of bills introduced since mid-January. The Florida legislature convened in biennial session April 4, bringing to 44 the number of states where legislatures met this year, but no measures of specific interest to the industry had been introduced in the southeastern state up to the time PIT AND QUARRY went to press.

In the field of general legislation organized labor's effort to gain enactment of state wage-and-hour laws to extend the scope of the national Fair Labor Standards Act of 1938 to intrastate commerce has thus far met with success in only one state—California. In several states such bills were defeated, while in others the legislatures adjourned without taking action on the proposals. While several states still have wage-hour bills before their legislatures, it is unlikely that any of them will gain passage.

North Carolina authorized a committee study of the question for the guidance of the next legislature. In Oklahoma, meanwhile, after state supreme court invalidation of provisions of a state wage-hour law enacted by the 1937 legislature applying to men and minors, the Senate passed by a large majority a bill calling for outright repeal of the act. House approval of the repealer, which was expected, would eliminate the remaining provisions of the act applying to women.

The failure of state legislatures to follow the national administration with minimum-wage and maximum-hour laws is shown by legislative debate on the proposals to hinge upon two principal factors: One, the desire to await additional experience with the operation of the federal law, and, two, growing public opposition to further restrictions upon business that would increase production costs and threaten a number of enterprises that might be obliged to shut down, creating additional unemployment.

Certain to attract attention in the field of labor legislation as an attempt to provide protection for both employee and employer was the labor-relations act sent to Minnesota's Governor Stassen on April 19. Affecting every employer and worker in the state, it differs markedly from the national Wagner act, nor is it as drastic as the legislation of Oregon. The governor's approval was expected.

For protection of the employer the act prohibits sit-down strikes; strikes without a required period for conciliation; any interference with transportation, with the use of public roads or with ingress to or egress from any place of business or employment; picketing by non-employees of "struck" places unless the majority of pickets are employees of the "struck" place, and more than one picket at a single entrance of a place where no strike is in progress.

For protection of the employee the act prohibits interference with the organization of employees; with collective bargaining and with lawful, concerted activities for collective bargaining; "blacklisting" by employers for complaints or organization activity; lock-outs in violation of the act's provisions; changes in wages, hours or working conditions without stated procedure; and spying on employees engaged in legal occupations.

With efforts in progress to bring about changes in the National Labor Relations Act and the tendency among state legislatures to put off the enactment of additional legislation sought by labor, operation of the new Minnesota act will be closely watched by both employers and labor leaders. Impartial observers proclaim it the sanest approach to a problem that has been the cause of much industrial strife during the past few years.

The following state-by-state summary brings up to date legislative action in the nonmetallic-mineral industries discussed in previous issues of PIT AND QUARRY, and treats also of proposals advanced during the past month:

*California.*—Still in the Assembly committee on revenue and taxation was the severance tax measure reviewed in this space last month.

The Assembly passed and sent to the Senate a bill which would allow the state department of industrial relations to investigate and mediate or arbitrate labor disputes, while the Senate approved a bill by one of its own members to establish a state labor mediation board. The differing action left in doubt just what form the question would finally take, but made certain that an arbitration measure would be enacted.

The Assembly labor and capital committee approved a bill to prohibit cities and counties from enacting anti-picketing ordinances.

Meanwhile in San Francisco the state appellate court ruled, in effect, that the closed shop was "contrary to public policy" in that it infringed on the individual employee's right to have full freedom of self-organization and designation of his own bargaining representatives. The American Federation of Labor unions involved announced an appeal to the state supreme court.

*Delaware.*—Final legislative approval has been given a House bill designed to bring non-resident contractors under the occupational-disease law through licensing. The Senate passed and sent to the House a bill to exempt gravel from the provisions of a 1937 act regulating the taking of sand from the beaches along the Delaware River, the Delaware Bay and the Atlantic Ocean.

Still pending in committee was a House bill to establish a state wage-and-hour law, as was a Senate bill to establish a new department of labor and industry by combining the present labor commission, the industrial accident board, unemployment compensation commission and board of boiler rules.

*Illinois.*—SB 31 and HB 55, identical measures to eliminate the use of machinery in the production of crushed stone or other road material by convict labor, reviewed last month, were still in committee, as was HB 160, to encourage the use of state gravel on public projects.

New bills would regulate the manufacture, possession, storage, transportation, sale or gift of explosives, repealing the present act covering this subject, and would provide a lien, in favor of any material man, laborer or mechanic performing work in connection with a quarry, mine, oil or gas leasehold, on the land and equipment on the land.

The Illinois Federation of Labor caused the introduction of state wage-hour and labor-relations bills patterned, respectively, after the national Fair Labor Standards Act of 1938 and the

Wagner act. No action had been taken on either measure.

*Iowa.*—House approval was given a bill to permit the use of gravel from gravel beds owned by counties for surfacing lanes and driveways leading to surfaced public roads when "such surfacing is necessary or advisable to protect said public road." Still awaiting a Senate vote was a favorably-reported bill to authorize the condemnation of private lands to obtain gravel and other suitable material for secondary-road surfacing.

*Kansas.*—After once being killed in committee, a House bill to prohibit the use of explosives within 500 ft. of any public cemetery was finally given approval by both houses of the legislature, only to receive a veto at the hands of Governor Payne Ratner.

"It appears that this bill might impose unreasonable and unnecessary restrictions on mining and construction operations," the governor said. "Many cemeteries are located along the public highways of Kansas. The provisions of this bill might interfere with the building and improvement of roads, bridges and highways. Also, farmers use explosives frequently in doing construction work. It also appears there is at present a penal statute in Kansas which will protect cemeteries, burial grounds and improvements thereon from being in any way molested or disturbed."

*Maryland.*—An effort to define "injury" under the workmen's compensation act to include occupational diseases failed of passage, as did a bill to levy a tax on the machinery used in Baltimore County which would reduce the number of men employed.

*Michigan.*—After being passed by both houses and sent to the governor for his signature, the legislature recalled for further consideration a bill to prohibit the removal of sand, gravel or other minerals from tax-delinquent lands.

Still in Senate committee was a Senate bill to make all occupational diseases compensable, to remove the maximum limit of $3,000 compensation, and further to liberalize the compensation statute in favor of the employee.

*Missouri.*—Governor Lloyd C. Stark approved a bill to broaden the unlawful detainer law to include sit-down strikes. Commenting on the bill, the governor said:

"In case of controversy between employers and employees as to the possession of the plant pending the adjustment of the trouble, this remedy of unlawful detainer, heretofore unavailable for such an emergency, furnishes a speedy legal trial of the rights of the respective employer and employees in a local court of the county where both the parties reside and in a tribunal elected by the people where at least the employees live."

*Nevada.*—Final legislative and executive approval was given a bill changing premium rates on industrial insurance by placing them on a sliding scale so that industries with fewer claims would pay less. Failing of passage was a bill to bring occupational diseases under the workmen's compensation insurance statute.

*New Jersey.*—Still in committee was a House bill to provide that a claimant for compensation for compensable occupational diseases shall file his petition within two years from the time such claimant ceased to be exposed to such occupational disease.

Advanced to second reading in the House was a bill to extend the provisions of the national Fair Labor Standards Act to intrastate business, while in committee was an Assembly bill to create a state labor-relations board.

*New York.*—New Senate bills would provide that, where natural stone is specified in the construction of public buildings or works by state or municipal corporations, preference must be given to such material mined, quarried or manufactured in the state and, if purchased from outside the state, the stone or granite must be in rough stock and fabricated within New York state. It would provide that the services or treatment rendered to workmen disabled by dust disease under the workmen's compensation law shall be for 90 days which need not be continuous, and such treatment may be extended for 180 instead of 90 days on an order of the industrial board.

Bills previously reviewed were still in committee, as were those introduced in the past month.

*North Carolina.*—Both houses approved a bill to make all state mining laws applicable to quarries. The lower house killed a bill to provide that the council of state shall give consent before the state can operate any quarry, mine or manufacturing plant.

*Ohio.*—A new Senate bill would exclude dump trucks used in hauling gravel, sand, dirt, stone and road materials from the jurisdiction of the public utilities commission.

Still in committee was a House bill to authorize sale of the state-owned Roseville brick plant. The House labor committee killed a bill to require labor unions to incorporate.

*Oklahoma.*—Bills calling for the construction of state-owned cement plants were still in committee.

*Pennsylvania.*—A new House bill would provide for payment of compensation for partial disability due to occupational diseases and would increase the payment for total disability resulting from such diseases. It was referred to the committee on workmen's compensation where a bill calling for payment in cases of silicosis reviewed a month ago was still being held.

House approval was given a bill to exempt explosives used in stone quarries or in clay mining from the provisions of a 1937 act covering the manufacture, storing and posesssion of explosives. It awaited a Senate vote.

A new House bill, which was given little chance for approval, would provide a 7-hr. 5-day week in all state industries except agricultural and domestic service and *"bona fide"* executives earning at least $25 a week.

*Wisconsin.*—The legislature passed and the governor signed a bill to outlaw "stranger picketing," which defines a labor dispute as a controversy between an employer and a majority of his employees in a collective-bargaining unit and prohibits picketing of plants or other places of business unless such a dispute exists. In effect it upsets a state supreme court decision declaring that a labor organization could picket the customers of a firm where a labor dispute was in progress.

"There can not be a sound and substantial economic recovery so long as employers and employees who are working together harmoniously are interfered with by outside influences," said the governor when signing the measure. He said that all the bill does is to prohibit one labor organization from interfering with the employees in another labor organization when such employees are getting along harmoniously with their employer.

## U. S. Tariff Commission Issues Report on Mica

The United States Tariff Commission has issued a report of nearly 300 pages concerning the mica industry of the world. Comprehensive data are given with respect to production, uses, and international trade in mica, including the effects of tariffs on such trade and the dependence of industrial countries on this essential but little understood mineral. The report also refers to the recent invention of a new product made from colloidal clays like bentonite and reported to be similar to or identical with mica in its most important electrical properties.

A limited number of copies of the report (No. 130, Second Series) are available for distribution by the Tariff Commission, or the report may be purchased from the Superintendent of Documents, at 25c. per copy.

## Quarries Make Gains in Accident Prevention

Early reports from mining and quarrying companies to the Bureau of Mines, covering operations during 1938, showed general progress in accident-prevention compared with the year 1937. The comparison is based on reports covering identical plants that were active during both years. Should a similar trend be shown by returns from companies whose reports have not yet been received by the Bureau of Mines, the record for 1938 will prove to have been a favorable one for most branches of the mineral industry as far as accidents to men employed at the mines and quarries are concerned.

The reports from operating companies also showed a reduction in the number of employees and in the number of man-hours of work performed at many properties. However, the reduction in accidents was usually greater than the decrease in employment, so that the accident rates based upon man-hours worked were generally more favorable than in 1937.

The figures upon which the comparison of 1938 with 1937 was made represent companies whose reports have thus far been tabulated by the Bureau of Mines, and they cover varying segments of the mining and quarrying industries, ranging from 23 per cent. in the case of limestone quarries to 61 per cent. in the case of slate quarries. Bituminous-coal mines are represented by reports from companies whose employees cover approximately 24 per cent. of the total number of men working in bituminous-coal mines in the United States. The figures for iron-ore mines cover approximately 36 per cent. of the total number of employees at iron-ore mines in all States. For other classes of operations, the per cent. of employment represented was 50 per cent. for mines producing nonmetallic minerals other than fuels, 46 per cent. for cement mills and quarries, 44 per cent. for marble quarries, 26 per cent. for trap-rock quarries, 29 per cent. for lime kilns and quarries, 34 per cent. for granite quarries, and 32 per cent. for sandstone quarries.

## New Fluxing Material Is Arousing Interest

A fluxing material known locally as "aplite" and occurring near Piney River, Va., has aroused considerable interest recently. It is a highly altered, white, massive rock consisting of albite and microcline feldspars, sericite, zoisite, clino-zoisite, and other minerals. A typical analysis shows the following: 59.80 per cent. $SiO_2$, 0.397 per cent. $Fe_2O_3$, 24.29 per cent. $Al_2O_3$, 5.86 per cent. CaO, 5.82 per cent. $Na_2O$, and 2.67 per cent. $K_2O$. The present trend toward the use of high-alumina ceramic fluxes encourages employment of this material in glass and pottery manufacture, but the relatively high iron content is at present an obstacle to its extensive use. According to reports, the iron is combined with other constituents of the rock in such a way that it is difficult to remove. By means of magnetic separators it can be reduced to between 0.2 and 0.3 per cent. which is too high for use in clear-glass products but is permissible for colored-glass containers. The deposit, which appears to be extensive, is under development by Dominion Minerals, Inc., Washington, D. C. A mill for grinding and purifying the rock began producing in November, 1938.

At the present stage of operation, the aplite is regarded as a supplementary material rather than as a competitor of feldspar. By blending aplite and feldspar, a product can be obtained higher in alumina than the average commercial feldspar, but care must be exercised to keep the proportion of aplite low enough to maintain an iron content below the permissible limit for clear-glass or pottery products. Because of its massive homogeneous structure, aplite probably can be mined much more cheaply than feldspar, which occurs in irregular pockets and lenses in pegmatite veins.

The future of aplite and the extent to which it will become a competitor of feldspar depend largely upon success that may be attained in reducing its iron content. In this connection it is pertinent to note that much progress has been made in treating feldspar. For instance, electrostatic machines are now employed in feldspar-grinding mills. It is claimed that they will take out impurities that cannot be removed with high-intensity magnetic separators. The applicability of such milling refinements to aplite is a subject for future investigation, reports Oliver Bowles of the U. S. Bureau of Mines.

## Rodgers Gravel Plant Soon in Operation

The Rodgers Sand & Gravel Co. will begin operations in Owensboro, Ky., shortly, according to an announcement by R. Emmett Rodgers, Evansville, Ind., one of the owners. The company has leased property at Hamilton Ave. and the Ohio River. New equipment has been purchased and work on the buildings at the site is in progress. J. I. Springfield, Madisonville, Ky., is associated with Mr. Rodgers. Thomas Rodgers, son of Mr. Rodgers, will be the local manager.

# Personal Mention

P. H. Bates, chief of the Clay and Silicate Products Division, National Bureau of Standards, Washington, D. C., has been awarded the Turner Gold Medal of the American Concrete Institute. Mr. Bates is a past-president of the Institute. The award was made for contributions to science, direction of research and outstanding leadership in advancing the intelligent utilization of cement and concrete.

W. S. Ernst, formerly chief chemist, Cumberland Portland Cement Co., Cowan, Tenn., is now general plant superintendent, and technical expert, Puerto Rico Cement Corp., Santurce, Puerto Rico.

T. G. Mooney, who was manager of the technical-service department of the North American Cement Corp., New York, N. Y., is now general manager of the Pozzorite Corp., New York, N. Y. His successor is A. T. Rogers, formerly chief of the Concrete Division of the District of Columbia.

Cephas Williams of the Williams Construction Co., Streator, Ill., has formed the LaSalle Stone Co. and is quarrying and grinding stone on a deposit near LaSalle, Ill., the entire output being sold for agricultural use.

M. E. Callander has been named president and general manager of the newly-formed Guardian Rock Wool, Inc., of Easley, Mo., where a plant to produce the material is under construction.

Ross Graves, L. G. Davis and Allen Norcross have formed the Blue River Sand Co. at Manhattan, Kan., and have started operating on the Blue River northeast of Manhattan.

H. Lee Mason, Jr., has been elected a director of the Alpha Portland Cement Co. to succeed the late J. M. Lockhart.

Charles A. Higgins was elected president of the Hercules Powder Co. at the recent organization meeting of the board of directors. He has been with the company since 1915 and succeeds R. H. Dunham, who continues with the company as chairman of the Board.

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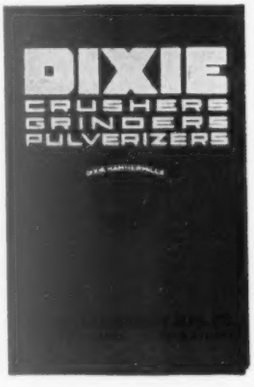


**DIXIE MACHINERY MFG. COMPANY**

4209 Goodfellow Ave., St. Louis, Mo.


H. W. KELLEY, owner and operator of the Kelley Sand & Gravel Co., Coquille, Ore., has sold the business to WILLIAM CHRISTIAN of Portland, Ore. The new owner has changed the company's name to the Christian Sand & Gravel Co.

B. E. LINDSTROM, who for many years has been manager of the Chicago office has been made District Manager in charge of the central states by the Barber-Greene Co. of Aurora, Ill.

ALBERT H. HINKLE, who has been director of the Kentucky Rock Asphalt Institute at Louisville, Ky., has been appointed district engineer at Cincinnati, O., for the Asphalt Institute. He succeeds MAJ. W. R. MACATEE who has been promoted to the management of the new Washington office of the Institute.

HERMAN FRAUENFELDER, closely associated with the concrete-products industry during more than 30 years, has been appointed district manager for the Pottsco department of the Celotex Corp. With headquarters in Cleveland, O., he will handle the development and sale of Pottsco light-weight concrete aggregate in the territories of western Pennsylvania, eastern Ohio and West Virginia. Mr. Frauenfelder is a past president of the Cast Stone Institute, and more recently sales manager of Marcrome Art Marble & Cast Stone Co. of St. Louis, Mo.

ELWOOD T. NETTLETON, president of the Connecticut Society of Civil Engineers, has gone to Albany, N. Y., where he will serve as secretary and engineering-director of the New York State Crushed Stone Assn. He succeeds R. L. LITEHEISER who is returning to his former post as engineer of tests of the Ohio Highway Department after a leave of absence.

HENRY W. ERICKSON, engineer in the crushing, cement and mining division of the Allis-Chalmers Mfg. Co., Milwaukee, Wis., has been transferred to the El Paso, Tex., district office. He joined the Allis-Chalmers organization in 1929.

C. W. CHURCHILL has formed the Pacific Coast Pumice Co. at Law, Cal.

ERNEST POE and RAYMOND THORNTON have established a sand-and-gravel plant at Clarkston, Wash.

W. J. STEWART, sales manager of the Stewart Sand & Material Co., Kansas City, Mo., has been elected president of the sales executives bureau of the Kansas City Chamber of Commerce.

J. A. GALLAGHER, who for many years has operated the Corvallis Sand & Gravel Co., Corvallis, Ore., and who has been a member of the Corvallis water commission for 12 years, was appointed city water superintendent by the commission March 21.

HARRY F. THOMSON, vice-president, and A. S. BUTTERWORTH, sales engineer, General Material Co., St. Louis, Mo., discussed *Modern Concrete Practices* before the Engineers' Club of St. Louis on the evening of April 13.

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FREDERICK W. HUNT, 82, formerly of St. Paul, Minn., died recently at his home in Philadelphia, Pa. He is said to have built the first practical machine for the manufacture of concrete blocks.

MRS. W. ALLEN GRUBB, wife of the district engineer for the Portland Cement Assn. in Seattle, Wash., died suddenly of a heart attack March 19. The Grubbs had just returned from a visit to the road show in San Francisco.

WILLIAM COYNER, 78, who retired from the sand-and-gravel business about 15 years ago, died recently at his home in Indianapolis, Ind.

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### ● New Finance Plan

Operators of both single trucks and small fleets are expressing considerable interest in a new finance plan recently announced by General Finance Corp., Chicago.

Applicable to both passenger cars and trucks, the "preferred buyers plan," as it is called, establishes a basic, 12-month finance charge of $3 per $100, plus the cost of insurance at conference rates. The plan distinguishes between the time buyer who makes a large down payment and one who makes a small down payment, adjusting the discount rate to the risk involved in each case. It is claimed that the sliding scale of rates, ranging from $3 to $6 per $100 financed, will enable finance cost savings up to 50 per cent. for most buyers.

A unique feature of the new plan is an arrangement whereby a prospective buyer can obtain an advance credit card, which when presented to any dealer, will be honored up to two-thirds of the purchase price of a new car or truck. Cards may be obtained by contacting any of the mid-west offices of the sponsoring company.

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### ● Pump Data Book

Economy Pumps, Inc., Hamilton, O., offers a new 1939 "Pump Data Book." The information has been arranged conveniently for the designer and user. The first part of the book deals with various classes of pumps. The second part is devoted to tabular hydraulic data.

Because the last issue was so quickly and completely exhausted, the company has been compelled to restrict distribution of the new edition to those most interested in pumps. It will be distributed free to engineers and users of pumps, making application on their company's letterhead. The book can be obtained by students or those without affiliations by enclosing the nominal sum of 60 c.

# Traffic News Digest

## LEGISLATION

*Transportation Act 1939.*—Many witnesses have been heard in connection with the proposed transportation act at hearings being held before the House committee on interstate and foreign commerce. Most of the testimony deals with matters that have been brought to the attention of the commission or to congress many times before. The basis of the proposed legislation is the report made by the committee of six railroad executives and representatives of railroad labor. P. H. Joyce, co-trustee of the C. G. W., said that his road had spent nearly $12,000,000 to maintain its right-of-way in the five years from 1934 to 1938 and had paid taxes of nearly $4,400,000. Since free rights-of-way were furnished to water carriers and trucks he suggested that the government assume 25 per cent. of the cost of maintenance of way of railroads which would amount to about $125,000,000 a year. The representative of the Mississippi Valley Barge Line Co., a privately-owned line, favored regulation of river carriers but was opposed to charging of tolls for the use of waterways. Representatives of the water lines were generally opposed to repeal of the 4th Section. Maj. Gen. T. Q. Ashburn, president of the government-owned Inland Waterways Corp., stated that the corporation had made a profit of more than a $1,000,000 in 1938. Representative Wolverton of New Jersey in commenting on this reported profit pointed out that 3 per cent. interest on the amount the government had invested in the corporation together with federal taxes that would have been paid by a private company, profits on government bonds sold by the corporation, postage, government wire service and other expenses paid by the government which were not included would have amounted to $1,116,156, so that the corporation was not profitable. General Ashburn said he would be in favor of selling the corporation if they could obtain around $23,000,000 for the property.

The monopolistic practices of the directors of the American Assn. of Railroads came in for some condemnation. The association was criticized for not allowing the carriers to make joint rates with trucking companies. Luther M. Walter of the C. G. W. complained about the administration of the Railway Labor Act and stated that his road had paid $105,000 to employees, who "never did a lick of work" because of rules maintained through the action of the National Railroad Adjustment Board.

In response to a request by Chairman Lea of the House Committee a report was submitted by Commissioner Eastman, Chairman of the Interstate Commerce Commission's Legislative Committee, giving the views of the commission on proposed transportation legislation.

Some of the high lights of this report follow:

(1) We favor comprehensive regulation by the Interstate Commerce Commission of all common carriers by water, and of all contract carriers competitive therewith, engaged in interstate or foreign commerce in all the domestic trades.

(2) With respect to proposed charges in regulatory provisions:


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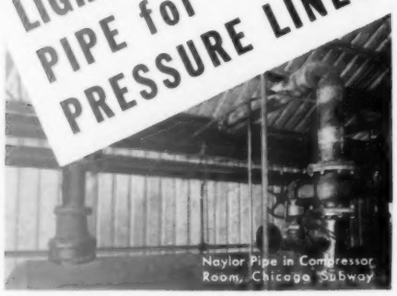

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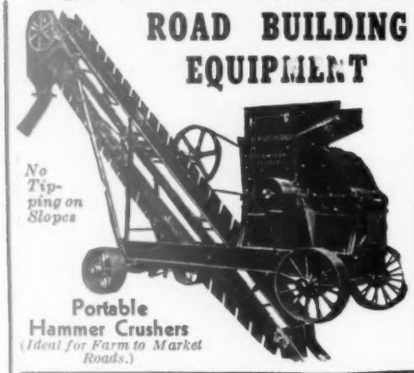

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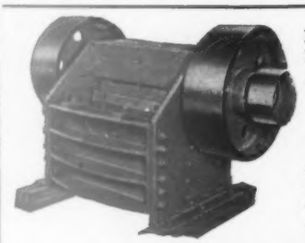
Stationary & Portable Rock and Gravel Crushing and Screening Plants—Single and Double Roll Crushers—Revolving and Vibrating Screens—Conveyors.



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(a) We do not favor the change in the so-called "rate-making rule" proposed by the Committee of Six.

(b) We favor, with a change in its wording, the amendment of section 5 (1) of t he Interstate Commerce Act with respect to the pooling or division of railroad traffic and earnings proposed by the Committee of Three and in H. R. 2531.

(c) We favor the amendment of the consolidation provisions of section 5 proposed by the Committee of Three, the Committee of Six, and H. R. 2531, but on the whole prefer, in some respects, the form which the amendment takes in the bill of the Committee of Six. We do not, however, favor repeal of paragraphs (19)-(21) or change of the present provision of section 213 (a) of the Motor Carrier Act with respect to acquisitions of motor carriers by railroads.

(d) We do not favor repeal of section 4 of the Interstate Commerce Act or of the so-called long-and-short-haul clause of that section.

(e) We do not favor the amendment with respect to intrastate rates proposed by the Committee of Six.

(f) We do not favor the amendment of the reparation provisions of the Act proposed by the Committee of Six.

(3) We do not favor the reorganization of the Commission proposed by the Committee of Six or in H. R. 2531, but do urge amendments which would

(a) Enable the Commission to delegate work, business, and functions without restriction to individual commissioners or board of employes, subject to opportunity for review by a division of the Commission, and under certain conditions by the Commission itself.

(b) Enable the Commission to establish by general rules limitations on the right of parties to seek review by the Commission of the action of a division or individual commissioner or board of employees, such limitations to confine the opportunity to proceedings of certain classes or descriptions involving issues deemed by the Commission to be of general transportation importance; and to create one or more appellate divisions to which petitions for rehearing generally, or in particular cases or classes of cases, could be assigned for final action.

(4) We favor the recommendation of the Committee of Three that a Federal Transportation Authority of three members, to be appointed by the President, be created for a temporary period to carry on in behalf of the Government specified research, planning, and promotional work in connection with transportation.

(5) We do not favor the proposal of the Committee of Six that the Commission be relieved of all responsibility in connection with railroad reorganizations either in equity receivership proceedings or under Section 77 of the Bankruptcy Act, and that a new Reorganization Court be vested with all the jurisdiction now exercised by both the district courts and the Commission over all matters connected with such railroad reorganizations. Nor do we advocate the somewhat similar, although more limited, proposal in H. R. 2531 for the creation of a Railroad Reorganization Court.

(6) With respect to loans to railroads, we favor none of the proposals, except those of the Committee of Three (a) that $300,000,000 be made available for loans to finance the purchase of rolling or shop equipment, the latter to furnish the security for the loans, and (b) that obligations to the Reconstruction Finance Corp. be accorded, in bankruptcy proceedings, a position with respect to realization on collateral similar to that now given to equipment obligations.

(7) We favor the proposals of the Committee of Three, the Committee of Six, and H. R. 2531 that the requirements in existing statutes for so-called "land-grant reductions" in connection with the carriage by the Railroads of Government traffic be removed.

(8) With respect to miscellaneous proposals of the Committee of Six.

(a) We express no opinion on the recommendation that Congress provide for the immediate disposal of the Federal Barge Lines operated by the Inland Waterways Corp.

(b) We express no opinion on the various proposals with respect to taxation.

(c) We approve as sound in principle the proposal that the railroads be relieved from the burden of contributing, disproportionately, to the cost of grade crossing eliminations.

(d) We approve as sound in principle the proposal that wherever a railroad is required, in connection with the improvement of navigable waters, to alter or reconstruct any of its bridges or other facilities, it shall be reimbursed by the government for all cost in excess of direct benefit.

(e) We approve as sound in principle the proposal that no reorganization plan shall be approved unless the fixed charges for which it provides are within the ability of the property to earn at all times, as demonstrated by its past experience.

The proposals contain little that is new. In substance most of them have been made before, and deviations are chiefly in form. This is not surprising, for after all there are only a few basic ways in which transportation conditions can be improved by government action. Relief may be obtained by better control of competitive conditions, or by increasing the internal efficiency of the carriers, or by improving their financial structures, or by loans from or decrease in burdens imposed by the government.

The Committee of Six, quite naturally in view of its composition, emphasizes the betterment of competitive conditions and minimizes efforts to increase internal carrier efficiency. The Committee of Three put most stress on the latter means of improvement. H. R. 2531 tends to emphasize the former, but does not neglect the latter. For our own part, we regard as of paramount importance efforts to bring about a proper integration of carriers of all types and to increase the economy and efficiency of their operations. As we stated in our last annual report, "Transportation success can never be the product of high rates and restricted service."

## RECENT I. C. C. DECISIONS

*Sand and Gravel.*—The Commission has modified its original report in 177 I. C. C. 123 and 197 I. C. C. 215 to allow the A. C. L. and the C. & W. C. to meet a truck competitive rate of 40 c. a ton on sand and gravel from Columbia to Bruner, Congaree and Eastover, S. C., and a water competitive rate of 60 c. from Salkehatchie to Charleston and a water competitive rate of 95 c. from Beldoc to Charleston, S. C. These rates are all lower than the scale established by the Commission for movement within the state of South Carolina. I. C. C. Docket No. 22,109, rates on sand, gravel, crushed stone, etc., within South Carolina.

The Commission has suspended orders covering the rates on sand and gravel within the state of Georgia in ten formal docket cases in order to allow the railroads to make rates to meet the competition of roadside sand-and-gravel pits and quarries. The carriers proposed to establish a mileage scale of rates beginning with a single-line rate of 55 c. a ton with a rate of 65 c. a ton for a joint-line haul for a distance of 10 mi. or less. At 100 mi. the rate is $1.10 for a single-line haul and

$1.15 for a joint-line haul. For 150 mi. the rate is $1.32 for a single-line and $1.35 for a joint-line haul. For both single and joint-line hauls the rate is $1.49 for 200 mi., $1.95 for 400 mi., $2.50 for 640 mi. and $3.70 for 1,120 mi. I. C. C. Docket No. 17,517 rates on chert, clay, sand and gravel within the state of Georgia.

*Wallboard.*—The Commission has found rates proposed by the southern carriers on wallboard not justified and has ordered the railroads to revise their rates not later than June 9, to remove the undue prejudice against New Orleans. The proposed rates were 22.5 per cent. of the first-class rates and would have been on a higher basis than the respective rates from other shipping points in the south. I. C. C. I. & S. Docket No. 4,517 wallboard in southern territory.

## EXAMINERS' REPORT

*Cement.*—Examiner George Esch recommends that the Commission find the rates on cement shipped in container cars between August 3 and Oct. 6, 1936, from Chapman, Hercules and Sandts Eddy, Pa., to Canawaugus, N. Y., unreasonable to the extent they exceeded the so-called 114 per cent. scale rates of 17c. from Chapman, 17.5c. from Sandts Eddy, and 17c. from Hercules. He proposes that reparation be awarded on these findings. I. C. C. Docket No. 27,855, Lehigh Portland Cement Co., *et al. v.* Lehigh Valley *et al.*

*Strike Demurrage.*—In a case covering demurrage assessed on 687 cars held outside of the plant of the Chrysler Corporation and 426 cars held within the plant during a sit-down strike at Detroit from March 8 to April 6, 1937, examiner H. W. Archer has made a proposed report involving some questions which have never before been before the Commission. Demurrage charges of $37,700 were collected on the cars held outside of the plant and $58,052 on within the plant. The complaint was brought on the charge of unreasonableness, undue prejudice and inapplicability. The examiner recommends that the Commission find that the demurrage on the cars outside of the plant was properly assessed since the forcible holding of the plant by the strikers did not prevent reconsignment or unloading of these cars. As to the cars that were in the plant he makes two recommendations. While the strike of the employees could not, of course, be considered an act of God it should nevertheless for the time being be considered an irresistible force or vis major, and should be considered in the same category so far as the obligations of the parties were concerned. It was a condition impressed on both parties, the shipper as well as the carrier, and without the will of either of them. The other alternative is that the Commission should find that on the grounds of impossibility of performance that the charges were illegally collected and should be refunded. In case both of these recommendations were rejected by the Commission the question of unreasonableness would arise. He pointed out that demurrage was for two reasons; first, a penalty for detaining cars from public use and second, as a compensation for the use of cars and tracks. He pointed out that in this case the assessment of a penalty no matter how great would have not resulted in a different situation than that which existed. He compared this case with the flood in the Ohio and Mississippi Rivers in 1937, when the carriers amended the demurrage rules so as to eliminate demurrage when conditions were such as to make it impossible for either shipper or carrier to function normally. Should the Commission find that a penalty was unreasonable in this case then there was the question of payment for the use of the cars. He said that the per diem was $1.00 per car and that


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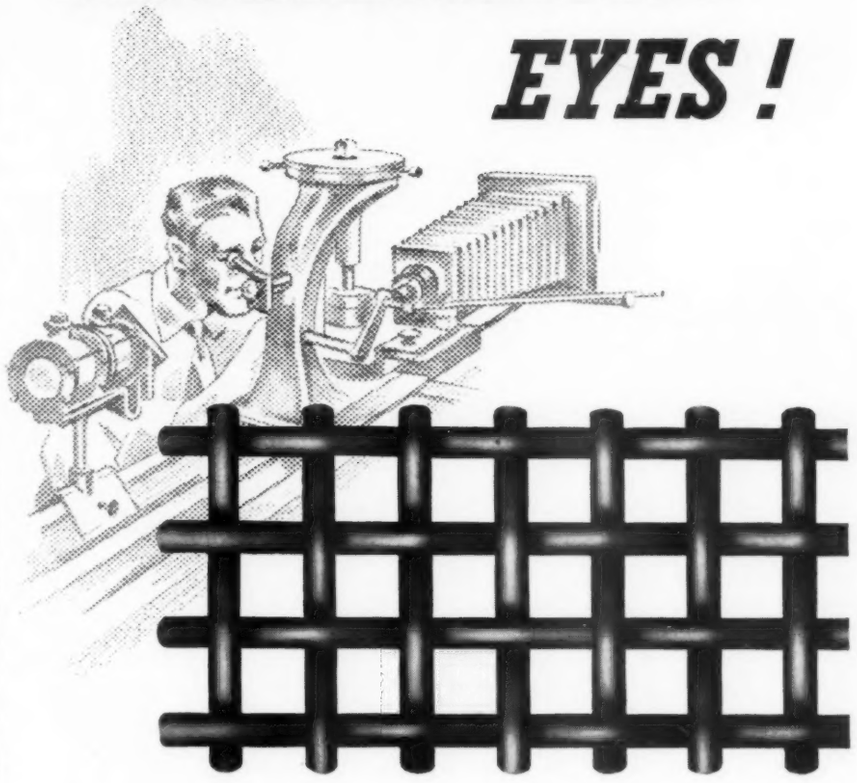

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in this case the parties should endeavor to reach an amicable adjustment as to just what constituted a fair compensation under the circumstances, subject to the approval of the Commission. I. C. C. Docket No. 27,950 Chrysler Corp. *v.* N. Y. C.

## NEW COMPLAINTS FILED

*Fluxing Stone.*—The Commission has instituted an investigation to determine whether the rates and charges of common carriers by rail or any of them operating in Ohio for intrastate transportation of fluxing stone from Marblehead to destinations in the Mahoning Valley, also Canton and Massillon, cause or will cause any undue or unreasonable advantage, preference or prejudice as betwen persons or localities in intrastate commerce, on the one hand, and interstate or foreign commerce, on the other, or any undue, unreasonable or unjust discrimination against interstate or foreign commerce under Section 13. This investigation was brought about by the Lakeside and Marblehead Railroad Co., together with the Ohio Public Service Co., and the Wheeling & Lake Erie Railroad continuing the rates on fluxing stone from Marblehead to Canton and Massillon and destinations in the Mahoning Valley without increasing the rates allowed by the Commission in Ex Parte 123. The proceeding was assigned for hearing May 4, before examiner Claude A. Rice, Columbus, O. I. C. C. Docket No. 28,218 intrastate rates on fluxing stone in Ohio

*Sand and Gravel.*—The Commission has suspended from March 29 until October 29 schedules in supplements 9 and 10 to Agent Peel's I. C. C. 3,046 and Agent Kipp's I. C. C. A-2,929 which proposed to reduce the rates on sand and gravel in carloads from Waco, Tex., to Supply, Okla. from $2.59 a ton to $1.50 a ton. I. C. C. I. & S. Docket No 4,609.


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# Occupational Diseases and the Law

## Limitations

*Morrison v. Industrial Accident Commission,* decided by the California District Court of Appeal, Third District, December 2, 1938; reported at 85 Pac. (2d) 186. This case involved a claim for total disability, and subsequently death, of a workman as a result of silicosis incurred in the course of his employment in a quartz mine. According to the California Industrial Accident Commission's finding of facts, the workman became disabled in August, 1934, from a condition which he was advised by a physician was the result of his occupation as a miner. His application for compensation was not filed until October 18, 1935. The Commission, therefore, concluded that his claim for compensation was barred by the statute of limitations—the requirement that claims of this nature must be commenced within six months of the date of the injury (Chapter 2, Part 4, Division 4 of the California Labor Code, Statutes 1937, page 294, Sections 5400 *et seq.,* formerly Section 11 of Chapter 586 of the Laws of 1917).

However, the workman was in the employ of the company from 1927 until August, 1934, and (after discovery of the illness) from October, 1934, to July, 1935, and the last payment of compensation was on August 17, 1935. He was on sick leave, with full pay, twenty-eight days in July and August, 1935. "During the last-mentioned period there can be no doubt the company knew he was physically disabled and unfit to render service on account of silicosis." The Court rules that the payment of full wages to the disabled workman on sick leave "will be construed to be compensation for his injury, and not mere wages of a man who was expected to return to his work," and that such payments suspended the running of the statute of limitations. The Industrial Accident Commission was, therefore, in error in concluding that the claim, filed on October 18, 1935, was barred by the statute of limitations, and the case is remanded with directions to the Commission to hear and determine the claim on its merits.

It was argued that the ruling would result in employers' refusing to pay wages to workmen who are temporarily ill, for fear that it would bind them to pay compensation in the event of future disabilities. The Court thinks not. "We assume that employers will not seek for technical grounds to escape the payment of just compensation which they legally owe to one who has been disabled or injured in their employ. Compensation is an obligation created by law in accordance with justice. The statute of limitations is a mere rule which limits the time within which a claim must be presented. It is adopted for the purpose of encouraging diligence and preventing injustice. It is a mere defense which may be waived, and should not become a trap to defeat just claims. The foregoing rule that the payment of compensation to a disabled workman under proper circumstances will toll the statute of limitations is fair and wholesome. It is characteristic of all human beings who are afflicted with incurable diseases, particularly with tuberculosis, to hope for recovery, and not to admit they are afflicted with an incurable disease so as to forfeit their jobs as a means of livelihood, until it becomes absolutely necessary to


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do so. The payment of wages to one who is afflicted with silicosis encourages him to believe he may continue in his employment. The payment of wages to one who is known to be fatally injured or afflicted is likely to lull him into false hopes and cause him to delay presenting his claim until the statute of limitations has barred it."

## Silicosis

*Simon v. Allegheny-Pittsburgh Coal Co.,* decided by the Court of Common Pleas of Allegheny County, Pennsylvania, January 26, 1939; reported at 87 Pittsburgh Legal Journal 41. This is an action in trespass brought by a plaintiff who alleges that he contracted pneumonoconiosis or silicosis while employed by the defendant as a coal miner, and that the contraction of said disease resulted from defendant's negligence. The question presented is whether, in view of the Pennsylvania Occupational Disease Compensation Act of July 2, 1937, supplementing the Act of June 4, 1937, the plaintiff has the right to maintain a common-law

*(Continued on page 64)*

# Trade Literature

*The Grico Twin-Motor Tractor.* 4 p. Gear Grinding Machine Co., Detroit, Mich.

*Quinn Concrete Pipe Forms.* 24 p. Quinn Wire & Iron Wks., Boone, Ia.

*Concrete for Industrial Buildings and Garages.* 40 p. Portland Cement Assn., Chicago, Ill.

*Better Grinding at Lower Cost.* 24 p. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

*Combustion Efficiency.* 4 p. Cement Mill Equipment Co., Plymouth, Mich.

*Heavy Duty Compressors—Class ES.* 24 p. Ingersoll-Rand Co., New York, N. Y.

*Gas Welding and Cutting Equipment.* 32 p. Victor Equipment Co, San Francisco, Cal.

*Roller Bearing Universal Joints and Flexible Drive Shafts.* 12 p. Mechanics Universal Joint Division, Borg-Warner Corp., Rockford, Ill.

*The 15 Semi-Automatic Jackbit Grinder.* 8 p. Ingersoll-Rand Co., New York, N. Y.

*The Hard-Hitting Pennsylvania Impactor.* 16 p. Pennsylvania Crusher Co., Philadelphia, Pa.

*Tandem Drive ½ Yard Truck Shovel-Crane.* 4 p. Michigan Power Shovel Co., Benton Harbor, Mich.

*The New Streamlined Patterson Unipower Agitator.* 4 p. Patterson Fdry. & Machine Co., East Liverpool, O.

*Three Element Feed Water Control,* 16 p. *Bailey Synchro-Meter,* 16 p. Bailey Meter Co., Cleveland, O.

*The Peck Overlapping Pivoted Bucket Carrier.* 24 p. Link-Belt Co,, Chicago, Ill

*The "Electric Ear"—A Device for Controlling Grinding Mills.* 8 p. Hardinge Co., Inc., York, Pa.

*Hydraulic Coupling Takes the Jolt Out of Excavating Costs.* 8 p. Hydraulic Coupling Division, American Blower Corp., New York, N. Y.

*Explosion-Proof Motors* 4 p. *Lo-Maintenance Direct Current Motors and Generators.* 4 p. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

# New Machinery and Supplies

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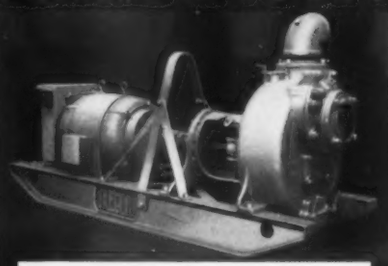

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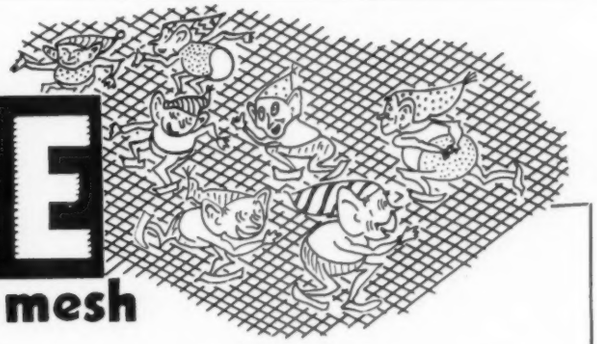
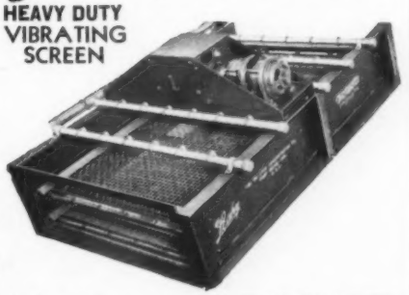
There's LIFE on every mesh



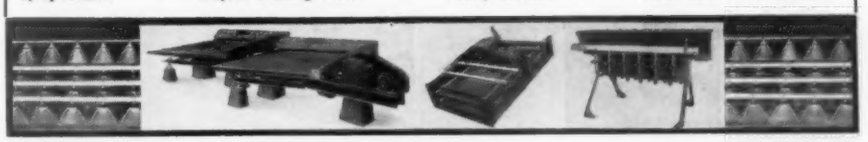
TRI-VIBE gives extra life and energy to every square inch of screen cloth. This new engineering feature, which is now making screen history, *triple-powers* the free-swinging screen jacket with dynamic LEAHY differential vibration and thus:—Prevents blinding, increases capacity, and insures uniformity in *fine screening*. Why use out-of-date equipment and be "out of pocket" when you can have the latest LEAHY Type C Vibrating Screen, which adds to your profits with new production economies. Ask for Bulletin 14H.

THE DEISTER CONCENTRATOR CO.
The Original Deister Co., Est. 1906
911 Glasgow Ave. Fort Wayne, Ind.

THE Leahy WITH TRI-VIBE
HEAVY DUTY VIBRATING SCREEN



Spray Nozzles • Duplex Washing Tables • Leahy Screens • Constriction Plate Classifiers



"HI" NATIONAL EXPLOSIVES
POWDER NATIONAL COMPANY
Reliable Economical

**A SYMBOL OF BLASTING EFFICIENCY**

Investigate NATIONAL'S six new Special AMMONIA DYNAMITES and two high stick count gelatin types.

Permissibles, Nitroglycerine, Gelatin Ammonia Dynamites, Flo-Free Dynamites, Blasting Supplies

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**TY-ROD**
**HIGH CAPACITY**
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in All Meshes
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THE W. S. TYLER
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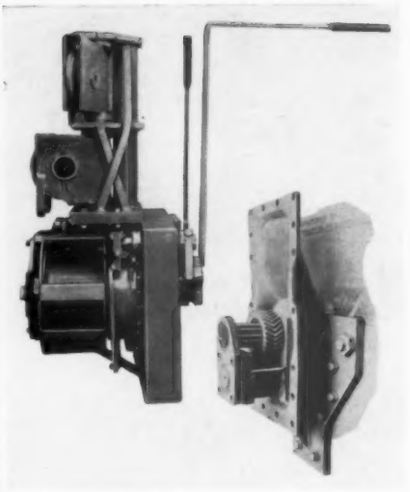
Cleveland, Ohio



Details of the new power-control unit.

lining for longer wearing, smoother operation, (7) controlled lubrication through a new oil ring, and (8) herringbone gears at vital points for greater power and strength.

With the interchangeable neck and gear-casing, it is now possible to have one gear-case for any size tractor from D4 to D8. One casing and several necks take the place of a full set of complete power-control units, greatly reducing the equipment investment.

## 80-Ton Truck

An interesting recent development in the heavy-duty truck field is the completion of the Super-Colossal tractor by the Dart Truck Co. of Kansas City, Mo. This giant of tractor-trucks is 10½ ft. wide, 10 ft. high and about 25 ft. long. It is designed to haul a semi-trailer of 80-ton payload capacity. The chassis weighs approximately 35,000 lb. Combined weight of chassis, trailer and load is in excess of 112 tons.

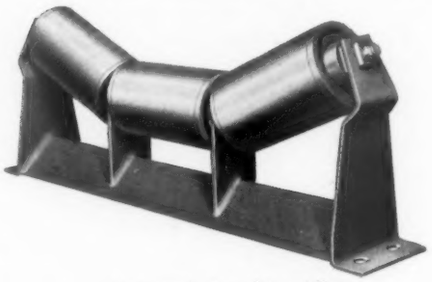
The truck is powered with two six-cylinder Hercules gasoline engines. The engines are equipped to operate with butane for fuel. Attached to each one of the engines is a large General Electric generator. Each generator drives a 125-hp. motor and each motor drives one of the tandem rear axles. With no mechanical connection between the engine and the driving wheels, starting and stopping are reported to be exceptionally smooth. A shift lever is required only for forward and reverse. The speed which is limited to 32 mi. per hr. is controlled by a foot accelerator. The vehicle will operate in reverse at the same speed as forward.

Before completion of the 80-ton trailer the truck operated with two 40-ton trailers, consequently it towed considerably more weight than is expected of it with the 80-ton trailer. Performance is said to be most satisfactory.

## Idler

The Pioneer Engineering Works, Minneapolis, Minn., announces a new and improved troughing idler for belt conveyors. Among the features claimed are: a self-cleaning base, welded construction, replaceable rolls, and simplified lubrication.

The base angle is laid with the open side down and the corner up, which prevents any dirt or gravel from piling up under the roller. The uprights are welded to the base and the ends are pressed steel which gives rigid construction, light weight, and neat appearance.



Improved troughing idler.

The rolls are made of welded tubing with cast-iron ends pressed in place. The bearings are protected with labyrinth seals that keep the dirt out and the grease in. It is only necessary to grease one end of this idler as the center shaft carries the grease to all bearings.

## Diesel Engine

The Worthington Pump & Machinery Corp., Harrison, N. J., has issued new literature describing its new type CC totally enclosed, direct-injection Diesel engine. Of the four-cycle, trunk-piston type, using a direct fuel-injection system, the new engine is of the simplest and most compact design consistent with high efficiency and complete accessibility. All moving parts are wholly enclosed.

The cone-type cylinder head featured in the

The 80-ton truck powered by two 6-cyl. engines.

CC engine is a Worthington development which has eliminated the possibility of head breakage due to load and temperature stresses. Full provision for expansion is made in this construction, and the need for a gasket between the cylinder head and the liner is abolished.

The lubrication system of the engine has been developed to a degree not exceeded by any other oil engine. All moving parts are pressure-lubricated. The main bearings receive their supply of oil from a cast-in, jointless oil pipe in the base. Positive sight-feed lubrication of cylinder walls is also provided. Liberal oil storage is built into a deep sump in the base beneath the screens.

This engine has been developed for installation where continuous, heavy duty loads are to be carried. It is applicable to municipal and industrial plants, and is an ideal peak-load unit for larger plants having other types of prime movers. It is adaptable to pumps, compressors and other power drives. It is particularly suitable for rock products plants, oil field work, grain mills, excavators and other similar installations where quantities of abrasive materials may be present in the air.

## • Car Loader

A material-handling machine of radically new design that is especially adapted to move bagged materials will find many uses around cement, lime and gypsum plants. It is known as the Clark Carloader, made by the Clark Tructractor division of the Clark Equipment Co., Battle Creek, Mich.

This finger-lift truck is only 38 in. wide, and pivots on one wheel, enabling it to operate in cramped quarters. The driver is mounted comfortably on top, with all controls conveniently located. He has clear vision of his pick-up, is amply protected by the hoist uprights. The forks pick up any load with as much as 2 in. underclearance and the machine carries its burden at speeds from 1 to 7 mi. per hr. There are eleven models, with capacities up to 3,500 lbs., tiering limits to 108 in.

The system of piling bagged materials and products on skids or pallets makes for low-cost handling and high, safe piling. The use of

**Caterpillar tractor and LeTourneau Carryall scraper dropping over a precarious 30-ft. crest and cutting down to the floor of the Peoria Concrete Const. Co. pit at Peoria, Ill., to build a roadway into the pit. After the road has been cut the outfit will haul spoil into this worked-out pit from nearby stripping operations.**

**The Strongest Part is the Spiral Seam**

**– and there is PLENTY OF SPIRAL**

THAT spiral lap welded seam reinforces each length of Taylor Spiral Pipe from end to end—gives it strength beyond that of any pipe of its weight. In Taylor Pipe the pitch of the spiral is carefully selected for each group of sizes to give the proper structural strength for the given pipe diameter, as shown above.

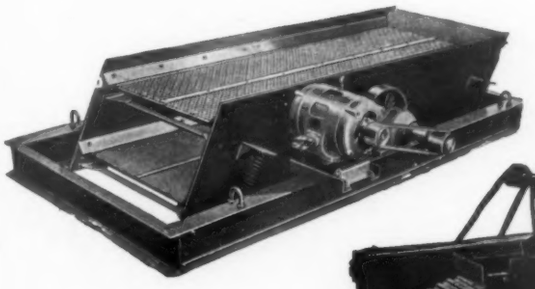
This stronger but lighter pipe can cut your costs. There is a type of joint—a type of protective coating—a size and gauge —for every service where a light walled pipe is used.

TAYLOR FORGE & PIPE WORKS
General Offices and Works: Chicago, P. O. Box 485
New York Office: 50 Church Street

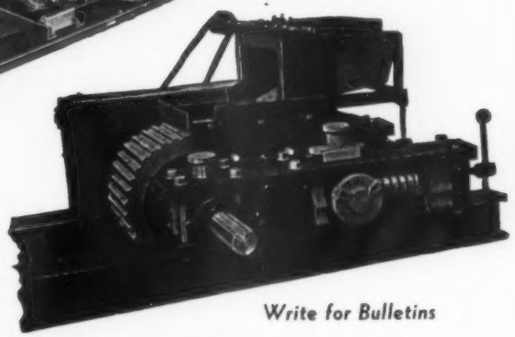
**TAYLOR *Spiral* PIPE**

**NEW HOLLAND**

CIRCLE THROW
**SCREENS**
FOR PROFITABLE GRADING



Lower your costs to rockbottom with a New Holland Vibrating Screen, and get a big increase in profits. The 100% safety factor in the eccentric drive shaft and bearings helps to reduce operating costs and maintenance expense. Built in six sizes with one to three decks.



This New Holland Roll Crusher will produce remarkable tonnage in uniformly crushed aggregates. It is a powerful machine of the latest type with a patent pulsating feeder that doubles capacity. Built in all standard sizes.

*Write for Bulletins*

**NEW HOLLAND MACHINE CO.**

New Holland Pennsylvania

SECO

VIBRATING SCREENS

▲

For continuous economical screening—with accurate sizing—and minimum attention, no vibrating screen will outperform a SECO.

SECO is the only screen that combines perfect balance and *positive control* of the gyrating motion.

SECO USES NO SPRINGS

It would pay you to check SECO before you buy a vibrating screen.

▼

SCREEN EQUIPMENT CO., Inc.

9 Lafayette Ave.

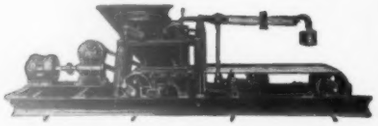
Buffalo, N. Y.

Some Good Territory Still Open for Dealers



MATERIAL WEIGHED and proportioned with

*99% Accuracy*



Weighing and proportioning material with 99% accuracy, Schaffer Poidometers are recognized throughout the cement industry as important equipment in modern plant control.

Schaffer Poidometers are automatic in action and will operate continuously or, with a mechanical weighmaster attachment, will provide batch operation.

This efficient weighing equipment is now saving thousands of dollars throughout the cement industry. Many leading plants are now saving money while obtaining greater efficiency with Schaffer Poidometers. Let us help solve your proportioning and feeding problems. *Write for catalog No. 5.*

SCHAFFER POIDOMETER COMPANY

2828 Smallman Street Pittsburgh, Pa.

SCHAFFER POIDOMETERS

The car-loader handling sacked material.

this machine provides easy, compact storage and in the shipping department one man and a machine can load or unload a freight car in two hours.

## • Well Drill

The Loomis Machine Co., Tiffin, O., has announced its latest Clipper well-drill, the K-2.

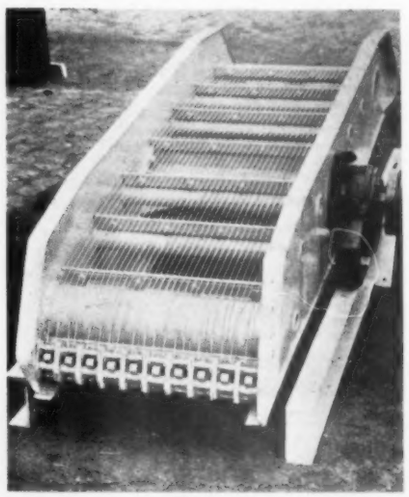
The new drill has an all-steel, electric-welded frame. The bull reel is chain driven and controlled by a clutch and will take 900 ft. of ½-in. line without a divider. An independent brake is also provided. Crown pulleys are mounted on one shaft and provided with oil-less bronze bearings.

The all-steel mast is sturdily guyed and can be operated by one man. The metal friction-driven sand reel is of ample capacity for any emergency and is operated by a single hand-lever. It is built to reduce line wear and engineered to speed up bailing. The reel spools 1,300 ft. of ¼-in. wire line.

The spudding shaft, of high-carbon alloy steel, is equipped with cranks on both sides of the machine, providing a maximum of power. The cranks are provided with three holes for adjusting the length of the stroke.

Furnishing power for all parts of the drilling machine, the jack shaft is made of high-carbon steel, mounted on self-aligning ball bearings. Mounted on this shaft is the twin-disc asbestos lined drilling clutch which controls the drilling motion. Another similar clutch controls the bull-reel sprocket which connects with the bull reel by a roller-chain drive. An efficient sand-reel fibre friction completes the assembly. The jack shaft is driven by a double chain from the motor.

The 16-hp. engine is available for speeds ranging from 1,200 to 2,600 r.p.m. It is a removable, 4-cyl. 4-cycle, air-cooled gasoline engine, variable speed, controlled by a lever on the driller's side at the front of the machine. The oiling system is self-contained, all parts being automatically lubricated. There are no grease cups nor oil fittings, no radiator, water pump, fan nor fan belt to cause trouble. The engine can be fitted with an electric starter, generator and battery at a slight additional cost.

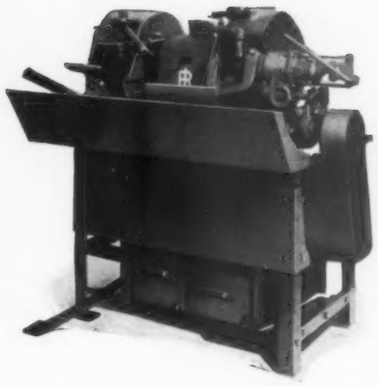


A vibrating screen, illustrated above, is being marketed in Germany which uses parallel one-way wires instead of mesh to size the material. It is possible to space the wires any distance apart to change the size of the "throughs." It is claimed that screening takes place at high speed since there is practically no resistance, as in the case of two-way mesh.

Exclusive manufacturing rights to the Ruth Dredger, an excavating machine for constructing and maintaining irrigation and drainage ditches and for other service, have been acquired by the Bucyrus-Erie Co., South Milwaukee, Wis. Henceforth, the machine will be called the Bucyrus-Ruth Excavator. All parts inventory has been moved to South Milwaukee, where the excavator will now be manufactured. Sales and service will be handled through the Bucyrus-Erie organization.

## • Twin-Motor Tractor

The new Grico twin-motor tractor brings to the heavy-hauling field a fully tested and proved principle of truck operation which has been definitely recognized as an outstanding contribution to the trucking business. It offers a tractor so powerful and flexible that it can produce 190 hp. under heavy hauling conditions—combined with stamina and speed—and then can drop down to an economical 95-hp. when the load is light. The same tractor is available with two 85-hp. motors (total of 170 hp.). The Grico Twin was designed and engineered to meet the transportation problem of developing great horsepower in a low net weight tractor and consists of the conventional Ford cab-over-engine short-wheelbase truck to which has been added a second engine placed immediately back of the cab and protected by a streamlined metal hood. It was designed for heavy service where tremendous power, reliability and flexibility must be combined with economical operation. The remark-



**A new semi-automatic high-production jack-bit grinder has just been announced by the Ingersoll-Rand Co. Known as the size J-5, this one-man machine is capable of increasing production to 60 average hard bits or 100 average annealed bits per hour. Gauging is done automatically while the operator is forming the face of the bit. This new machine is adaptable for use with all types of standard detachable rock-drill bits.**

able economy results from the fact that a large, heavy load is pulled with two engines, while the empty or minimum payload can be returned on one engine. Again, when operating with a small load on a level road using one engine, the second engine can be cut in when approaching hills or heavy going without stopping the load, or reducing speed.

The use of two Ford 95- or 85-hp. motors provides unequalled power, the engines operating together or independently. Everything about the tractor is dual—2 motors, 2 batteries, 2 starters, 2 drive lines, 2 driven axles, 2 gas tanks, 2 transmissions—but with a single throttle, single gear shift lever, and sing'e clutch and brake pedal, and operated as a single unit at the will of the driver. Operating alone, either motor is run by its individual controls. An important features is the double compression drag of the two motors which makes for a lighter use of the vehicle's brakes and also provides greater control at all times. The Grico Twin is said to have the highest horsepower per lb. of vehicle weight and as high a motor torque as any large truck available—it pulls top loads with ease and speed without load transfer between driving axles. This compact tractor, built of fully proven equipment, allows greater payload capacity because of lower tractor weight. The economical Ford motor-exchange plan is always available.

A free bulletin containing complete technical data, mechanical specifications, diagrams and prices of the Grico Twin-motor tractor may be obtained by writing the manufacturer, the Gear Grinding Machine Co., Detroit, Mich. The company also offers to analyze individual hauling requirements and to make recommendations.

**Two engines with a total of 190-hp. drive this truck.**

## ● Arc Welder

A small motor-generator type arc welder, said to provide greater convenience and accuracy in welding because of a new self-indicating dual continuous current control, is announced by the Lincoln Electric Company, Cleveland, O.

Because of its advanced features and moderate price, this unit is expected to widen the application of welding in new fields such as aggregates, lime, gypsum and cement plants, and similar plants in the process industry.

The welder, known as the SA-150, has both job selector and current control calibrated and equipped with dials which indicate the type of work and number of amperes for each and every setting. It is claimed that this development enables the welding operator to secure highest quality welds and highest possible welding speeds because he can vary both the slope of the volt-ampere curve and the amount of welding current independently and positively to suit every job encountered. Both voltage control (job selector) and current control are continuous in operation, providing countless possible combinations of voltage and current. According to the manufacturer, this feature simplifies the setting of the control and accounts for an exceptionally wide welding range as to types of work, welding conditions, sizes of electrodes and thicknesses of materials. Being continuous, the control can be advanced or retarded in increments as fine as desired.

**Motor-generator type arc welder.**

The SA-150 is powered with a Linc-Weld squirrel-cage induction type motor for across-the-line starting. Connections are readily accessible for either 220 or 440 v., 3 or 2-phase, 60 or 50 cycles as desired; the machine can be supplied for 550 v. or special voltages.

Construction is arc-welded drip-proof steel. Four steel feet welded to the base and drilled permit bolting the welder in stationary installations or attaching the optional three-wheeled running gear. Floor space occupied is less than 4 sq. ft.


**End Your Kiln Troubles WITH**

**PYRASTEEL Kiln Ends**

●

They are indispensable to fuel economy in cement plants, because they make tight sealing possible. Resultant fuel savings often run as high as

**TEN TONS OF COAL PER DAY**

in average 2000-bbl. plants as shown by comparative tests on operating kilns, before and after being equipped with PYRASTEEL Kiln Ends.

Note the simple, sturdy construction . . . easy type of installation . . . and convenient design for lining.

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**Chicago Steel Foundry Co.**
37th Street at Kedzie Ave.
CHICAGO ILLINOIS
Makers of Alloy Steel for 30 Years

**Segmental Construction**

Makes for easy assembly
. . . eliminates heat strains
. . . permits replacement of single units

**ROGERS CRUSHERS are GOOD CRUSHERS**

10" by 36" Anti-Friction Bearing Crusher

**7 REASONS WHY!**

1— UNEQUALLED PRODUCTION (Users' Report)
2— LOWEST MAINTENANCE COST (Users' Report)
3— UNMATCHED RUGGEDNESS (Experience Shows)
4— LARGE CAPACITY BEARINGS (Failures Unknown)
5— LARGE DIAMETER ECCENTRIC SHAFT (Failures Unknown)
6— HEAVY WELL PROPORTIONED CRUSHER BED (Failures Unknown)
7— DEPENDABLE AND LOWER PRODUCTION COSTS (Results—Confirmed by Continued Repeat Orders)

*Bronze or Roller Bearing*

—All Types and Sizes of Crushing Plants Available—

**ROGERS IRON WORKS COMPANY**

300 10th STREET — JOPLIN, MO.

Write for Bulletins Nos. 302 and 304

Crusher Builders for 40 Years

Give Us Details of Your Crushing Problems



IT COSTS NO MORE — TO USE THE BEST

REPLACE WITH *"Indian Brand"* MANGANESE STEEL

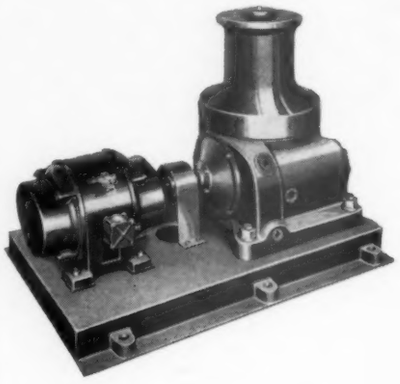
LONG LIFE ABRASION RESISTING PARTS FOR QUARRY, ROAD, DREDGING, AND MINING MACHINERY

**The Frog, Switch & Mfg. Co.** CARLISLE, PA.

*ESTABLISHED 1881*


## • Car Puller

For economically, quickly spotting railroad cars for loading or unloading, the Link-Belt Co. announces that it has developed a line of two new vertical-capstan electric car spotters, designated as No. 5-A and No. 10-A, respectively capable of 5000 lb. rope pull or moving



New motor-driven car puller.

one to three cars, and 10,000 lb. rope pull or capacity to move three to six cars, depending upon track conditions, whether level, on grade, straight, or curved.

The new machines employ a high torque electric motor of user's choice, connected to spotter drive mechanism by an encased flexible roller chain coupling, and mounted with the spotter, on a welded steel base plate.

The vertical capstan, made of semi-steel or cast steel, is machine-finished to prolong the life of the haulage cable. A sturdy housing completely encloses and protects the gearing. A ratchet and pawl are furnished when required, mounted inside the capstan, for holding cars on an incline when the power is off. The No. 5-A spotter is equipped with 5-hp. motor; the No. 10-A machine requires a motor of 10-hp.

The company continues to build its No. 5 and No. 10 spotters, which are more self-contained and much more compact, requiring no separate base plate, and having the 5 or 10-hp. electric motor mounted on the side of the machine as an integral part of it.

## Silicosis *(from page 59)*

suit in trespass and trial by jury. The employment terminated on June 16, 1936. The Occupational Disease Compensation Act went into effect January 1, 1938. The suit was begun on January 29, 1938. The Court holds that since there was no employment or contract of employment between the defendant and the plaintiff after the effective date of the Act, there was no obligation on the employee to give notice (as provided for in Sections 302 and 303 of the Workmen's Compensation Act of 1915) of his intention not to be bound by the 1937 enactments concerning occupational diseases. Hence the employee is within his rights in suing under the common law.

# Book Reviews

THE STONE INDUSTRIES. By *Oliver Bowles. Published by McGraw-Hill Book Co., 330 West 42nd St., New York, N. Y. 519 p. Price $5.00.*

This is the second edition of this volume and in it the author, who is supervising engineer of the building-materials section, U. S. Bureau of Mines, has brought its contents up to date, particularly with respect to the statistical tables. Centers of production have shown little change during recent years, so that only minor corrections were needed. The sections on technology as covered in the first edition were based largely on the author's personal observation and study, and reflect modern practice so comprehensively that little revision was required. The various chapters deal comprehensively with the geology, technology, distribution and uses of crushed stone and dimension stone.

PORTLAND CEMENT. By *Richard K. Meade. Published by Chemical Publishing Co., 148 LaFayette St., New York, N. Y. 707 p. Price $10.00.*

A new edition in an attractive binding of one of the standard authorities on the subject. The text matter has had little or no change from the previous editions and covers the manufacture, analytical methods and physical testing of Portland cement. The introduction traces the development of the industry in the United States, points out the relation between mortar materials and describes the nature and composition of Portland cement. The major portion of the text has to do with the manufacture of the material, including quarrying, processing and manufacturing economics.

A. S. T. M. STANDARDS ON CEMENT (1938), *published by the American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. 107 p. Price $1.00.*

The 1938 edition of the special compilation of A.S.T.M. Standards on Cement includes five specifications covering Portland cement, high-early-strength Portland cement, natural cement, masonry cement, and sieves for testing purposes. There are also given in their latest approved form the standardized methods of sampling and testing Portland cement, chemical analysis of Portland cement, compressive strength of Portland-cement mortars, and fineness of Portland cement by means of the turbidimeter. There is also included for information and to stimulate comment, a proposed draft of a method of test for autoclave expansion of Portland cement.

In the Manual on Cement Testing which gives helpful supplementary information on the standard methods there is provided a list of selected references on Portland cement.

## TRADE NOTES

The Bucyrus-Erie Co., South Milwaukee, Wis., announces the appointment of the Great Lakes Supply Corp., Chicago, Ill., as distributor in its territory for Bucyrus-Erie excavating machinery.

The Harnischfeger Corp., Milwaukee, Wis., announces the appointment of W. G. Dixon and Associates, St. Louis, Mo., as agent succeeding O. D. Hicks & Co., former St. Louis representative.

Early in April, the Quaker City Rubber Co. moved its Chicago office and warehouse to 2035 S. Michigan Ave., where it occupies the entire building. The branch is under the management of George C. Johnson.

# PIT AND QUARRY Special Section

PROFITABLE NEW PRODUCTS

Bulk-cement unloading and batching plant for ready-mixed concrete, Smoot Sand & Gravel Co., Washington, D. C.

# Two Clay-Brick Pioneers Now Manufacture Concrete Units

By HARRY F. UTLEY

LEFT — The vibration-pressure machine photographed on the day it went into service.

DEPOSITS of clay and carboniferous shales in central Illinois have long been utilized in the manufacture of brick and other clay products. Two of the oldest producers, the Western Brick Co. at Danville and the Poston-Springfield Brick Co., at Springfield have been dominant factors in their fields for years.

Several years ago, however, the Western Brick Co. also became interested in the possibilities of concrete units, equipped a plant, and has since produced thousands of concrete blocks, while only last year the Poston-Springfield concern began to make concrete building units and at present is said to be the leading producer of concrete blocks at the Illinois capital.

The clay-products plant of the Western Brick Co. at Danville also produces much light-weight aggregate known as Haydite. This burned-shale product is distributed to licensed concrete-products manufacturers in the Middle West. It is only natural, therefore, that this company manufactures Haydite blocks exclusively. Its plant is located at the Mill Street Bridge on the western limits of Danville and the Haydite is brought to the plant by motor trucks from the brick works where it is manufactured about 1½ mi. away.

In March of this year the company made plans to more than double its annual output of 200,000 Haydite units and installed a No. 9 Joltcrete machine. With this new, fast-production vibrating equipment, which makes three standard blocks at one operation (9 per min.) the company expects to produce

Empty rack cars at the yard end of the curing tunnels.

and ship at least a half-million units this year. The initial mold equipment allows the manufacture of 4-in. and 12-in. blocks in addition to the standard 8-in. units. The concrete base on which the new machine was mounted was poured with concrete made with high-early-strength cement so that it was ready for use in a comparatively short time after placing.

Cement is received by railroad in paper bags and is carried into the plant on a 175-ft. Goodyear conveyor belt which extends from the loading track to the mixing platform. A Besser

Mixer which supplies concrete to the new vibration-pressure machine.

Part of the Haydite-block storage yard at the Western Brick Co. plant located on the outskirts of Danville.

Block storage at the Poston-Springfield plant. Note flues from clay-brick ovens in background.

batch mixer of 21-cu. ft. capacity is used and a new flight conveyor, fabricated by workmen at the plant, carries the concrete to the Joltcrete machine. As the units are borne off, they are placed on Chase hinged-deck rack cars mounted on shock-absorbing flanged wheels. The hinged decks are locked in an upright position for loading and unloading to speed up this phase of the operation, making it unnecessary for the workmen to reach between the decks for the units. The blocks are steam-cured in 110-ft. tunnels of which there are 10, each accommodating one

Mixer and conveyor which feed the old tamper.

row of curing racks which are moved in and out over industrial tracks.

A Universal tamper is also used at the Western plant to produce special shapes. It is a down-face machine which can be converted to a stripper. It is fed by an Ideal mixer.

Except for the new Joltcrete machine which has its own electric-motor drive, power for the mixers, the tamper and the conveyors is supplied through shafting by a 30-hp. General electric motor.

Although the greater portion of the Haydite block output is sold in the immediate vicinity, the company ships by railroad to cities in Illinois as well as into Indiana, Kentucky and Wisconsin.

The shale which is used to manufacture the Haydite aggregate comes from the 400-ft. level of the company's No. 1 mine. It is burned and expanded in short rotary kilns. The finished fine aggregate for use in block manufacture has a maximum size of 7/32 in. and has a fineness modulus of 2.75. The coarse material used is between 1/4 and 1/2 in. in size. Sizing is accomplished by brooming the material through stationary round-mesh screens. Normally the concrete is mixed in proportions of 1:6:6, although this may vary with conditions of manufacture.

When the writer visited the plant, of which Harry Allen is superintendent, the Joltcrete machine had just been installed and production was getting under way under the watchful eye of J. B. Herzog, installation engineer for the Stearns Mfg. Co., Adrian, Mich. Mr. Herzog was "commuting" between Danville and Peoria at that time, a similar machine being installed at the Michigan Silo Co. plant at Peoria under his supervision.

All the units manufactured at the Poston-Springfield plant are made of gravel concrete. Inspired by the success of its concrete-products branch, which went into operation in the summer of 1938, the Poston-Springfield Brick Co. has been making numerous improvements this spring. Its production machine is a Besser Champion plain-pallet stripper. Because of difficulties experienced with its original mixing equipment the concern has just replaced it with a Besser batch mixer and skip-loader. Operations are conducted at a profit due to efficient management and firm marketing control, prevailing retail prices this spring being 17 c. per plain unit and 19 c. each for rock-faced blocks.

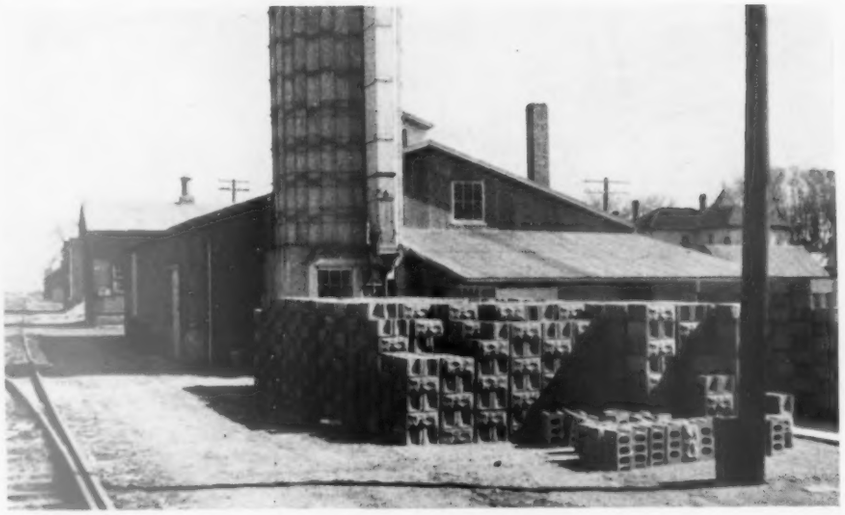
The plant is located in a building formerly used in making clay bricks and the old brick tunnel kilns which adjoin it are well suited to curing the concrete units. Steam is used to heat the kilns and provide moisture. The operations are in charge of George ("Slim") Moon.

According to Emmett Poston, a company official, the firm is now at work in its own shops constructing a vibrating machine for the manufacture of concrete joists and pre-cast slabs.

# A Modern Products Plant in an Illinois Corn-Belt Town

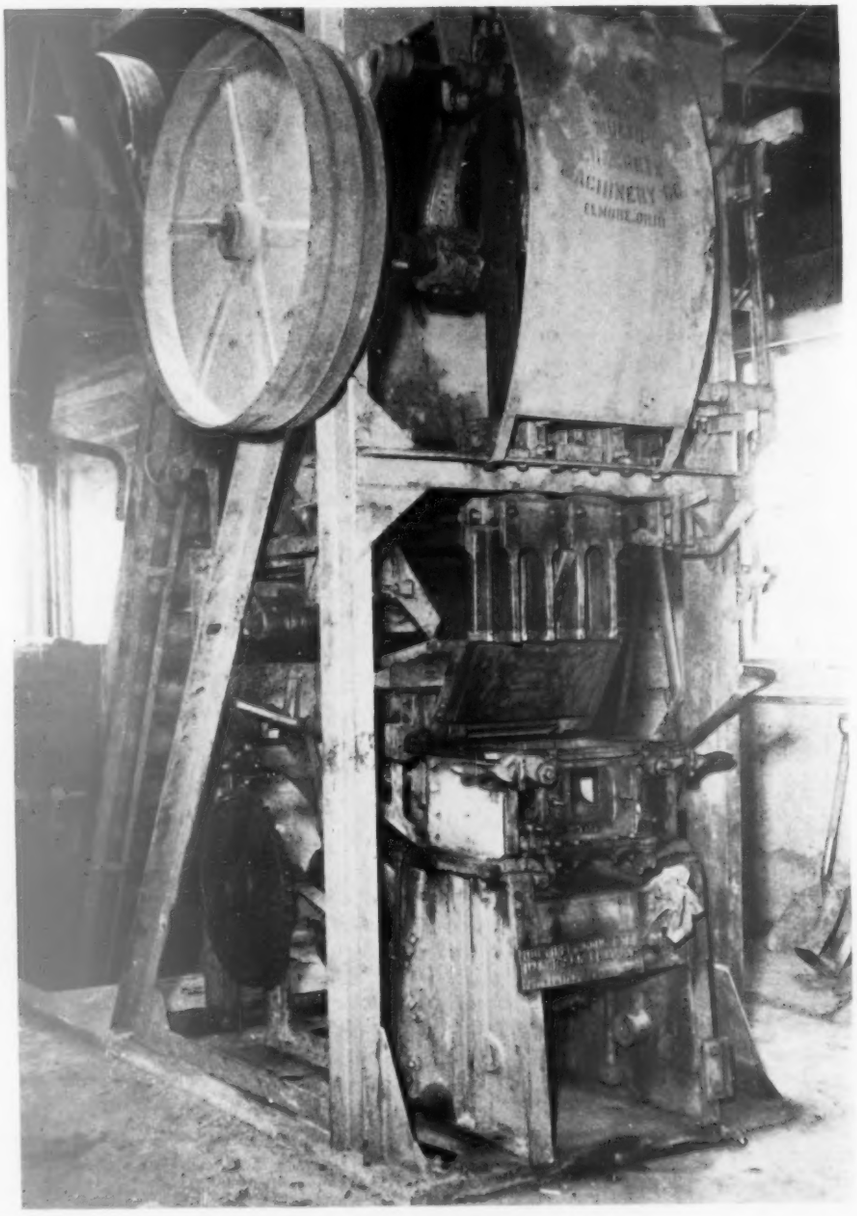
CISSNA PARK, ILL., is a typical rural town in the heart of the corn belt. In driving about the vicinity the visitor is considerably impressed by the large, well-maintained farm houses, barns, corn-cribs of huge proportions, and the general air of prosperity which prevails. Cissna Park serves this substantial corn-growing community and much of the building material used in that area is supplied by a locally-owned concern, the Cissna Park Coöperative Lumber Co. Concrete units have been used extensively for building and last year the company decided to manufacture its own instead of retailing the purchased product. As a result it installed a small, modern plant on its property located along the Chicago & Eastern Illinois Railroad and the venture has been a distinct success.

Aggregates and cement are received by railroad, the former being shipped in from Indiana pits. With the aid of a portable conveyor and an installed bucket-elevator the aggregates are stored overhead in a concrete-stave silo 9 ft. in diameter and 24 ft. high. The bottom



The Cissna Park plant showing the concrete-stave aggregate-storage silo.

The mixer with aggregate spout above and the elevator to the block machine.



This power stripper is the production machine at the Cissna Park plant.

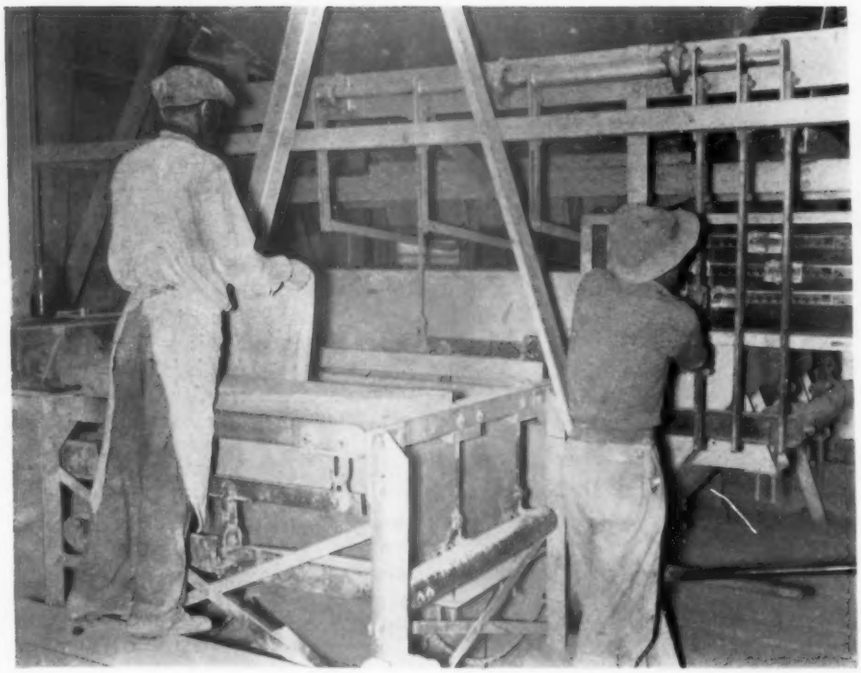
of the silo is 8 ft. above the Multi-Mixer and the aggregates are loaded directly into the mixer through a lever-controlled spout.

The mixer is of the end-discharge type and the concrete is dumped direct to the boot of the elevator of the block machine. This is a Multiplex Model T standard tamper, equipped for power stripping with attachments allowing the manufacture of either stripped or face-down units. It has a capacity of about 1,500 standard blocks per day. A single electric motor drives the tamper, elevator and mixer. Substantial wooden racks are used, being handled by a Barrett-Cravens rubber-tired lift-truck. After curing inside for a few days the units are moved to outdoor storage.

Smooth-faced units retail for 15 c., while the rock-faced units bring 18 c. Dealers in the neighboring towns of Paxton, Gilman and Buckley also handle the product of the Cissna Park plant.

The plant is in charge of Fred Barth, Jr. and Arthur Beckman.

Jack-lift truck which handles the racks.



By W. E. TRAUFFER

LEFT—Interior of the main plant of the Anderson-Dunham Concrete Co. showing the cement and aggregate batchers.

# Expands Ready-Mixed-Concrete Operations in Baton Rouge

TYPICAL of the growing number of producers of ready-mixed concrete who are rapidly pushing this industry into the "big-business" class is the Anderson-Dunham Concrete Co. of Baton Rouge, La. This growing city, although the state capital, has a population of less than 40,000 and it is cities of this size which have been largely responsible for the rapid growth of this industry in recent years.

The company put its main plant in operation early in 1938 and until recently supplied all the demands from this point. Recently a contract was secured to supply a large quantity of concrete for several construction projects on the opposite side of the city. A temporary plant was set up between these two jobs with the intention of moving it to a permanent location when they are completed.

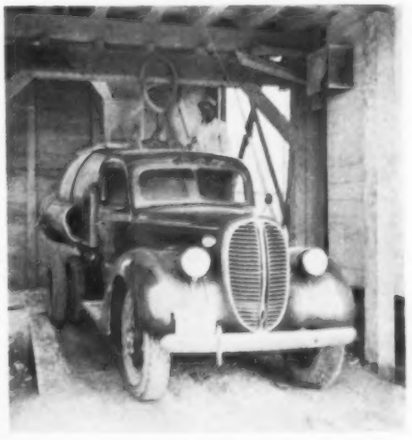
The company also has a Chain Belt Rex 27E paver which is being used for contracts of over 1,000 cu.yd. This mixer is set up at the job and dry-batched aggregates are hauled from a portable batching plant at the nearest railway point. It is said that this service appeals to contractors as the company can buy aggregates and cement cheaper than they and, because its equipment is in use a larger part of the time, other costs will also be lower.

At the main plant sand and gravel are received by railway and are unloaded by a ½-cu.yd. Northwest gasoline crane to a walled storage in three-sections with a total stock-pile capacity of 3,000 cu.yd. The same crane serves the 3-compartment, 150-ton Butler steel bin. Cement is received in sacks, which are elevated to the batching floor where there is storage space for 2,000 bags. There is also a warehouse with a capacity of 8,000 sacks. A rotary bag-cleaner is used.

Aggregates are weighed in a Butler batcher with a 3-beam scale and tell-tale dial. There is also a cement batcher with a scale, but this is used only when cement weighing is specified, usually on large contracts. Otherwise cement is dumped from sacks, using the batcher only as a hopper. The company started with eight Chain Belt Rex 1½-cu.yd. truck-mixers. Three additional mixers were purchased late in November. All are mounted on Ford V8 truck chassis.

The paver which is being used to supply concrete on large projects.

The temporary plant consists essentially of a 2-compartment, 72-ton Butler bin and an aggregate batcher.



One of the truck-mixers being loaded at the main plant.

Sacked cement is being used and is loaded into the trucks from a hopper at a warehouse. Truck-mixers are being used to haul concrete about ½ mi. to one project. This plant is also being used to dry-batch the materials for a construction program at Louisiana State

(Continued on page 72)

The office building with the plant in the background.

General view of Galvez St. yard showing new lime-putty and ready-mixed-concrete plants.

The lime-putty plant with some of the truck-mixers used for mixing and delivering mortar.

Part of the company's fleet of mortar and concrete mixer-trucks.

# Jahncke Shifts Concrete and Mortar Operations to Galvez Street Yard

By W. E. TRAUFFER

THE closing of a section of the New Basin Canal for the widening of Claiborne Ave., one of the main thoroughfares in New Orleans, La., was partly responsible for the development of the modern Galvez St. yard of Jahncke Service, Inc. This canal serves one of the important industrial sections of the city and, until it was closed for a few blocks near its dead end, served the company's yard at Liberty St. where its old concrete central-mixing plant was located (*P & Q*, Sept. 11, 1929). As most of the sand and gravel used in the concrete is received in barges the company took advantage of the opportunity to build a new plant at its Galvez yard.

The new plant, which went into operation in May, 1937, is built entirely of steel and concrete. It easily produces from 200 to 250 cu. yd. of concrete on an average day and has produced 340 cu. yd. in 11 hr. The efficiency of this plant and the use of bulk cement have considerably reduced the cost of production of the concrete. The old Liberty St. plant had a capacity of only 80 cu. yd. daily and used sacked cement entirely.

Early in 1938 a new Brooks-Taylor lime-putty plant was put in operation at the Galvez St. yard. This plant has also been very successful and during the past year has been operating steadily at its capacity of 60 cu. yd. of lime mortar daily.

At times the demand was so great that some vat curing had to be done. Three vats, with capacities of 15, 30, and 50 cu. yd. respectively, were used. The acceptance of this product has been very gratifying and it is being used in all types of construction including residential. Most of the demand is for lime mortar but some putty is sold in bulk and in 4-cu. ft. barrels. In order to take care of this demand three additional lime-putty aging tanks are now being added to this plant. When these are in use the use of curing vats to supplement the original plant will be discontinued. The capacity of this operation, now 40 cu. yd. daily, will be increased to 125 cu. yd.

Both these plants were completed just in time to enable the company to secure contracts to furnish concrete and mortar for the new Charity Hospital of the State of Louisiana, a $15,000,000 structure which is now near completion. Concrete is sold in quantities as small as ¼ cu. yd. Most of the large jobs use strength concrete and efforts are being made to sell the smaller users on its advantages.

The Liberty St. yard is now used only for the distribution of sand and gravel received by railway. The company also has yards at Carrolton St. and the canal, where sand and gravel and shell are received by water. Clam-shells and reef (oyster) shells are stored for use in roadways, driveways, etc.

At the Galvez St. yard no shell is stored. A clam-shell derrick transfers sand and gravel from barges to a portable belt-conveyor which places them in piles. A Brownhoist travelling pier crane with a 1-cu. yd. clam-shell bucket operates on a 425-ft. track and distributes these materials to and reclaims them from stock-piles. This crane also serves the concrete-mixing-plant bins and several batching and truck-loading bins in the yard. The various types of aggregates stored include lake-shore sand, Rigolets sand, pit concrete sand, Pearl River concrete sand, Horn Island Gulf sand for filtration, Pearl River gravel and Prophet Island gravel. A

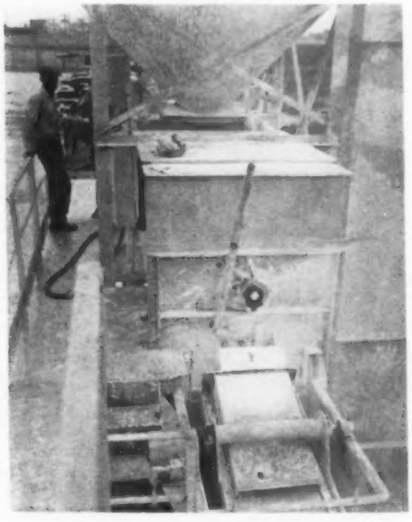
complete line of building materials is also carried.

Three sizes of concrete aggregates—sand, ½-in. gravel and ¾-in. gravel—are stored in the three compartments of a 99-cu. yd. Blaw-Knox steel bin. Bulk cement is unloaded from box-cars by hand scrapers into a hopper. A screw-conveyor feeds a bucket-elevator which discharges the cement into either of two Blaw-Knox steel storage bins holding 32½ bbl. each. Usually two brands of cement are stored. When these bins are full the cement overflows into two 325-bbl. steel tanks, which are

A truck-mixer being loaded at the new concrete central-mixing plant.

used for reserve storage. Each of these tanks feeds back into the cement-unloading screw already mentioned.

Cement is discharged from these bins through two rotary valves into a 4,000-lb. Blaw-Knox batcher with a single-beam scale. Compressed air is used to keep the cement flowing in these bins and in the reserve storage



The hydrator and vibrating screen used in the lime-putty plant.

tanks. Aggregates are discharged through lever-operated clam-shell gates into a 2-cu. yd. Blaw-Knox batcher, which is equipped with a 3-beam Winslow scale. A Neptune meter and automatic trip valve give full automatic water control. In charging the 2-cu. yd. T. L. Smith tilting mixer about half the water is let in before the aggregates and cement are put in. The dumping of the mixer is done hydraulically and is controlled from the batching floor. A batch meter can be used to control the mixing time when this is required.

The company now operates a fleet of 24 truck-mixers which are ordinarily used as agitators. By means of a gate in the mixer-feed chute the aggregates and cement can be dry-batched into them. On some of the larger jobs the plant mixer is used only to shrink the concrete and the remainder of the mixing is done in the trucks.

Concrete deliveries have been made as far as 20 mi. when mixed in transit.

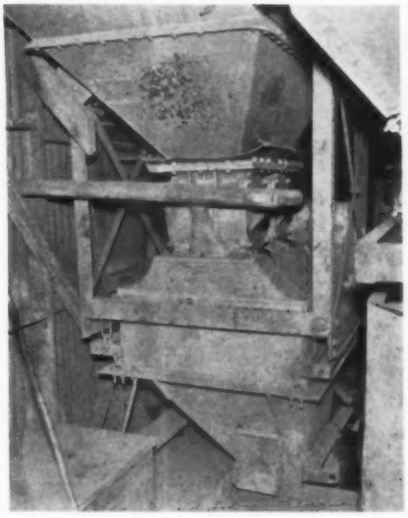
The truck fleet includes seven 3-cu. yd. and seven 2-cu. yd. Blaw-Knox mixers, all except one of which are mounted on International and General Motors trucks. All these mixers have been purchased in the last two years. The 3-cu. yd. trucks are usually loaded with two 1½-cu. yd. batches. The other ten units are 1-, 1½- and 2-cu. yd. Concrete Transport mixers, which are also used for mixing and delivering lime mortar.

Orders for concrete are received direct from customers by telephone in the plant office, which is on one side of the batching floor. A 4-copy dray receipt is made with the original charge sheet. The original and one copy are sent out with the load and one is signed by the customer and returned. One copy is for job control and the other, on which the specifications for the mixture are shown, is retained by the operator.

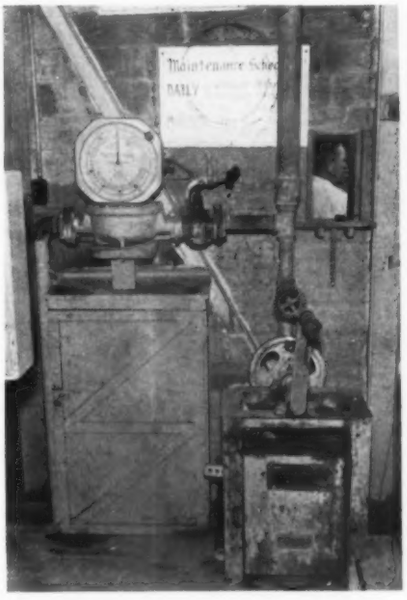
A time-card system is used for the truck drivers who punch "in" and "out" for each load they deliver. A microphone and loud-speaker are used to call and instruct the drivers. Orders are lowered and raised by an endless rope. A speaker system also provides constant contact with the company's main office.

The lime-putty plant is a standard two-tank Brooks-Taylor plant identical in design with those which have been described in past issues of PIT AND QUARRY. It was fabricated and erected by the Chicago Bridge & Iron Co.

Lime from eastern Tennessee is received in box-cars and is elevated into a tank, from which it is fed into a slaker. Lumps and foreign matter are screened out before the milk-of-lime is pumped into the two aging tanks. Excess water is drawn off and the putty



The two rotary valves and the 4,000-lb. batcher which measure cement into concrete mixer.



At upper left is automatic water meter. At lower right is the batchmeter which can be used to control the mixing time.

is thoroughly seasoned before it is sold. A movable batcher is used to load the lime putty into the Concrete Transport mixers.

The three new aging tanks are to be mounted on straight legs which will elevate their cone bottoms only about 6 ft. off the ground. The stiff aged lime putty will be pumped from these tanks by a special pump through a 4-in. pipe-line across the yard to a central mortar-mixing plant. This consists of an elevated sand bin and sand-weighing batcher. A stationary open-type 2-cu. yd. mortar mixer is installed under the batcher. Putty is discharged from the pipe-line into another weighing batcher from which it is discharged

The travelling crane which handles all aggregates to bin and ground storage.

into the mixer. The mixed mortar is then dropped into dump trucks for delivery. The same slaking equipment used for the original plant will supply these three additional tanks.

## Anderson (from page 69)

University where the paver is being used to mix the concrete.

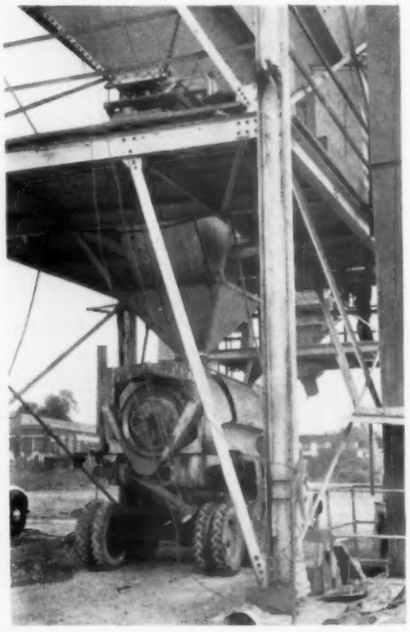
A new ⅜-cu.yd. American Gopher gasoline crane was used in setting up the portable plant and now handles all the aggregates used. The aggregates are received by railway and are transferred to stock-piles having a capacity of 35 carloads. The warehouse holds 5 carloads of cement. Miscellaneous orders for concrete are also filled from this plant if convenient.

The company's office is in a modern building near the main plant. In another building is a Multiplex stripper block machine, but the company has not yet actively pushed the sale of this product. The company also sells cement, plaster, aggregates and other building materials.

## Cementstone Corp. Is Formed at Pittsburgh

With the announcement of the organization of the Cementstone Corp. of Pittsburgh, Pa., for the purpose of effecting a nation-wide standardization of prefabricated concrete units, produced by newly patented principles of manufacture, there comes the further announcement that the company's units are so coördinated with standard steel construction elements that the structure of a fireproof building may now be built of prefabricated concrete and structural steel, and that costly poured forms will not be necessary. The D. J. Kennedy Co. of Pittsburgh is the corporation's first licensee for the manufacture of Cementstone products and it has gone into production.

W. P. Witherow, founder of the Witherow Steel Corp. and president of Blaw-Knox Co., is chairman of the Cementstone board; Leslie M. Johnston, former vice president and general manager of A. M. Byers Co., is president, and Albert Henderson, who developed the system, is consulting engineer. The corporation will manufacture precast concrete products and will supply its patented equipment to licensees in designated areas throughout the United States. These licensees will be granted exclusive rights to manufacture under the corporation's patents and its trademark "Cementstone."

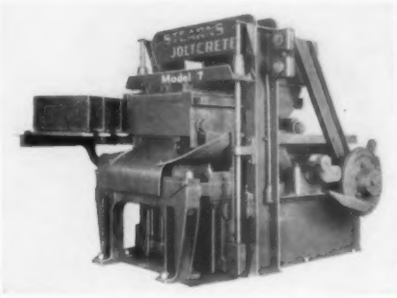


One of the Blaw-Knox truck-mixers being charged with concrete materials at the new ready-mixed plant of the John T. Dyer Quarry Co. at Pottstown, Pa.

## • Block Machines

The tremendous interest in the vibration method of concrete products manufacture is perhaps the most significant development in the field since the introduction of the power stripper. Its future influence upon the production of concrete units is bound to be great. In this connection the Stearns Manufacturing Co., Adrian, Mich., has announced its new

(Continued on page 73)




Vibration machine which makes 7 blocks per min.

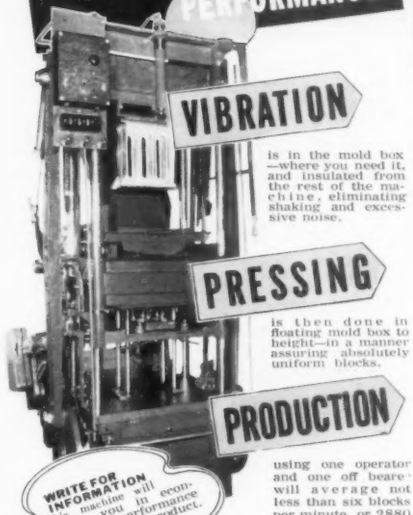
## New Batching Plant at Annapolis, Md.

The new batching plant of the Henry B. Meyers Co. at Annapolis, Md. Sand and gravel are received by truck from the plant of the Massaponax Sand & Gravel Co., Fredericksburg, Md., 18 mi. distant. From a hopper the belt-conveyor shown carries the materials to the bins overhead. Steam coils in the bins heat the aggregates in cold weather.

Materials are proportioned by weight and discharged into Smith-Mobile mixers mounted on Ford V-8 trucks. Loading is quickly accomplished, the large charging chute making it an easy matter to "spot" the mixer beneath the bin gates, cutting trip time to the minimum.

Deliveries are being made to a number of construction jobs in progress at Annapolis. This view shows the Smith-Mobile discharging a load at the construction site of Annapolis' new post-office. The high angle of discharge makes a hoist or unloading ramp unnecessary.

NO QUESTION ABOUT THE KENT-ROOT VIBRA-PRESS PERFORMANCE



VIBRATION is in the mold box—where you need it, and insulated from the rest of the machine, eliminating shaking and excessive noise.

PRESSING is then done in floating mold box to height—in a manner assuring absolutely uniform blocks.

PRODUCTION using one operator and one off bearer will average not less than six blocks per minute, or 2880 in eight hour day.

WRITE FOR INFORMATION this machine will amaze you in economy of performance and quality of product.

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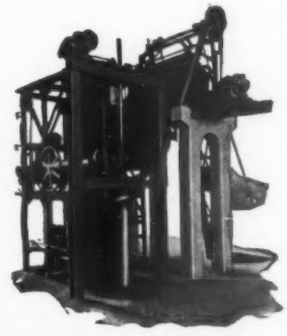

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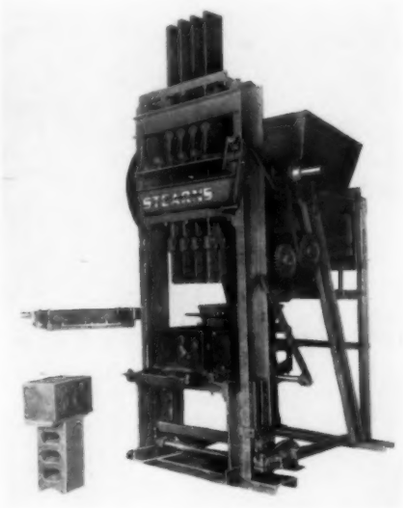
*(Continued from page 72)*

model Stearns Joltcrete No. 7, of smaller capacity (7 blocks per min.) than the regular Joltcrete machine. This machine will fit many plants whose market does not require the large output of the No. 9 model or will serve as an auxiliary machine for producing specials and uncommon sizes in the larger plants.

Model No. 7 is exactly like the Joltcrete No. 9 except as to hourly output and mold-box capacity. It employs the same patented vibration of limited amplitude, vibration under pressure, the same automatic cycle. It makes at each operation two standard 8-in. by 8-in. by 16-in. blocks or their equivalent. Normal performance is 3½ cycles per minute, or better than 400 blocks per hour. Like the No. 9 model, it may be equipped with mechanical off-bearing device to allow one-man operation.

A new machine also is introduced for use in those plants that still have a market for blocks made with special facing material and other than plain faces. This is the Stearns "Clipper" down-face block machine making rock, plain, panel and various other face designs in fulls, fractionals, single and double corner for 4-in., 8-in., 10-in., and 12-in. wall thickness. Rated capacity is 150 8-in. by 8-in. by 16-in. blocks per hr.

The machine can be readily converted for the manufacture of stripper blocks by the substitution of different mold box, tamp feet and




Tamper for making faced units.

a stripping device. Contrarywise, the present owner of a Stearns Clipper stripper, Stearns Jr. or Anchor Jr. stripper may equip his machine to make faced blocks by applying the down-face assembly. Either conversion can be accomplished in less than an hour.

The down-face equipment, which is made by Stearns Mfg. Co., Adrian, Mich., is said to embody all the features that experience has shown to be essential for the rapid, low-cost production of fine looking faced blocks. These items include:

(1) rigid-end mold box; (2) steel fabrication, resulting in almost complete elimination of castings; (3) large air-space cores; (4) efficient, quick-acting finisher plate; (5) core-pulling mechanism so designed that pulling cores is made easy in spite of severe, heavy tamping; (6) Stearns alternate 8-bar tamping, producing the maximum number of high quality blocks per bag of cement.

## ● Vibrator-Grinder

The Marvel-Wyco combination concrete vibrator and grinder just placed on the market is a finished product of the best features, in a combination of several, that have been in actual service for the past seven years.

The vibrator head is made with a cast, alloy-steel rotor, scientifically balanced, running in two Norma-Hoffman roller bearings with a third ball bearing, acting as a heavy-duty thrust bearing, encased in a hard seamless steel tube housing, positively sealed against entry of oil, water or dirt. The vibrator nose is also cast of chrome-nickel alloy-steel; the life of each head under ordinary working conditions will run as high as 1200 hr., it is claimed. The unit is powered with Lauson and Wisconsin air-cooled engines, or by standard makes of electric motors for operation on a.c. or d.c. lines. It is being marketed by Concrete Equipment Manufacturers, Chicago, Ill.

## TRADE NOTES

The Bucyrus-Erie Co., South Milwaukee, Wis., has appointed the Gulf Tractor & Eqpt. Co., Houston, Tex., to represent them in that territory where they will handle the Bucyrus-Erie shovels, draglines and buckets, clamshell, lifting cranes and drag shovels ranging from the ⅜ to 2¼-cu.yd. size.

Among the many things to attract visitors' attention at the New York World's Fair 1939, when it opens on April 30 will be an educational exhibit by Link-Belt Co. in the Metals Building, adjacent to Theme Center.

This Link-Belt exhibit will portray in working models, photo murals, and colorful, realistic dioramas and translites, how industry can ease labor's burdens, expedite production and reduce costs, by using mechanical conveying equipment for handling materials from where they are to where they are wanted next.

**The Clipper Stripper, shown above, available in 5 models, is only one of the popular machines in the ANCHOR Line of Complete Equipment for the Concrete Products Plant. ANCHOR Engineering Service in the design of new plants or revamping older operations is nationally famous. Consult us before you buy equipment or modernize your plant . . . it costs no more.**

**Hobbs block machines, Anchor tampers, Anchor, Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers and pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.**

ANCHOR CONCRETE MACHINERY CO.

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**COMBINATION HOT AND COLD MIX PLANTS**
Using the Combination Two Fire Dryer Cooler.

**HOT MIX PLANTS**
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**DRYERS**
Combination Two Fire Dryer Cooler
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**STEAM JACKETED ASPHALT BUCKETS**
Stationary, bottom discharge type.

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Cummer-Robins inclined type for any make or size of asphalt plant.

**MIXERS**
400 to 5000 pound batch, steam jacketed, with the new mixer teeth adjustable for top or binder without change.

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# PROTECT
**the wearing parts of your earth moving equipment with**

# COLMONOY No. 1
**(Yellow Tip Electrode)**

The deposit from this crystal coated rod is tough, hard and shock-proof, making it well adapted for resisting the rough treatment which such parts invariably receive.

The price is within the range of the so-called self-hardening rods, which makes it suitable for uses where price is a controlling factor.

Write our nearest branch for General Catalogue No. 70.

**Manufactured by**
**WALL-COLMONOY CORP.**
**1059 W. Grand Blvd.**
**DETROIT, MICH.**

BOX 977
LOS NIETOS
CALIFORNIA

3155 SENECA ST.
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40 OAKWOOD SQ.
MILLVALE, PITTSBURGH, PA.

558 W. 54TH ST.
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2054 W. HARRISON ST.
CHICAGO, ILL.

3445 E. SANDWICH ST.
WINDSOR

1103 MILLWOOD RD.
TORONTO

5725 ST. DENIS ST.
MONTREAL

# BROOKS-TAYLOR
*Lime Putty Plants*

Jahncke Service placed this standard 2-tank Brooks-Taylor lime putty plant in operation in New Orleans a year ago last January. Within the past few weeks, they have installed three additional ageing tanks.

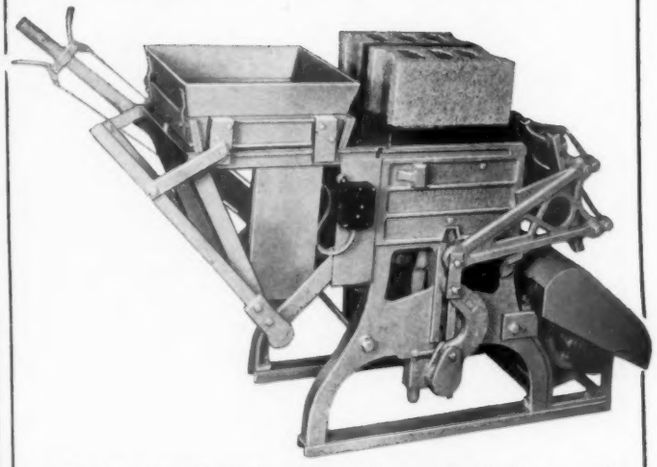
**If you operate a ready-mixed concrete plant or a building supply business you, too, can increase your volume by supplying your present customers with brick mortar and aged lime putty for plaster. Write for information on a standard Brooks-Taylor plant to meet your requirements. Address nearest office listed below. No obligation.**

**CHICAGO BRIDGE & IRON COMPANY**

Chicago.....2451 Old Colony Bldg.
New York.....3389—165 Broadway Bldg.
Cleveland.....2264 Rockefeller Bldg.
Philadelphia.....1645—1700 Walnut St.
Boston.....1550 Consolidated Gas Bldg.
Houston.....2919 Main Street
Tulsa.....1648 Hunt Bldg.
Birmingham.....1503 North Fiftieth St.
Dallas.....1486 Liberty Bank Bldg.
Detroit.....1552 Lafayette Bldg.
San Francisco.....1092 Rialto Bldg.
Los Angeles.....1457 Wm. Fox Bldg.

Plants at BIRMINGHAM, CHICAGO & GREENVILLE, PA.

# This Time Tested Unit Now Available *with Vibration*



This is the Multiplex Model C Double Stripper with the new variable speed vibrator attached. Vibrates while filling, and pressure is applied to finish top of block.

Makes plain and face block in all sizes from 3" to 12" in width, with press-top finish.

Investigate this new unit.

**THE MULTIPLEX CONCRETE MACHINERY COMPANY**
ELMORE OHIO

1 — 1½ — 2 — 3 — 4 — 5 — 6 CUBIC YARD SIZES

# IT'S YEARS AHEAD!

As building activity increases, the sale of ready-mixed concrete is rapidly replacing bulk materials as a profitable business.

In this expansion, Jaeger more than ever takes the lead—with basic improvements in water measurement and distribution and Vacuum Cab Controls—features found in no other truck mixer—features originated by Jaeger just as Jaeger originated the modern, 3-point mounted, Double-End Cone, Self-Cleaning Drum with Throw-Back Reversing Blades, that produces higher strength concrete, mixed end-to-end and discharged in mass.

Today, alert business men who have seen the opportunity and studied the methods of successful operators, are buying Jaeger Truck Mixers. THERE ARE MORE JAEGER TRUCK MIXERS AND AGITATORS IN USE TODAY THAN ALL OTHER MAKES COMBINED.

**THE JAEGER MACHINE CO., Columbus, Ohio**

**SEND FOR YOUR COPY— NEW 68-PAGE DATA BOOK FOR READY-MIXED PLANTS JUST OFF THE PRESS!**

Whether you are already operating a ready-mixed plant or planning to start one, you will find this book an invaluable guide and reference on modern truck mixer and agitator operation, compiled by the world's largest manufacturer—up-to-date, authoritative, complete.

THE JAEGER MACHINE COMPANY
602 Dublin Avenue, Columbus, Ohio

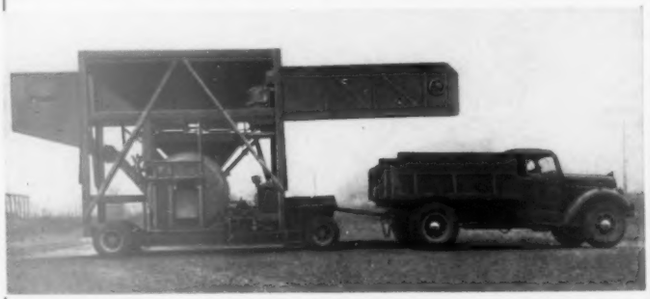
Gentlemen:

We are interested in 1939 data on Ready Mixed Plants with Truck Mixers and Agitators, including set-up, operation, maintenance costs, selling of strength concrete, etc., as well as new developments in mixer design.

Name _____

Address _____

## STRAYER PORTABLE CONCRETE PLANT



Plant in Transit

### A DOUBLE DUTY PLANT

A Portable and Central Mixing Plant, combined in one unit—Towed by Truck.

Reduces labor cost—No waste—No extra haul—No rehandling of materials—No costly setup and take-down. Load, store, batch materials and mix concrete on job or other location.

Load transit mixers or other trucks. Extends bidding territory. Designed, built, and fully equipped to produce low cost concrete under any specification. Approved by engineers.

Write for Complete Information

Plant in operation on job

**ERIE STEEL CONSTRUCTION COMPANY**
**BOX 1031-P, ERIE, PENNSYLVANIA**

"I'm probably the youngest shovel operator that ever swung a dipper stick—but already PIT AND QUARRY is my favorite magazine."

## NEW Sewer and Culvert Construction

By making concrete pipe on the job with Quinn Forms you give more men more work, can use less experienced labor and produce uniform concrete pipe of highest quality. Recognized standard of all concrete pipe.

**QUINN PIPE FORMS**

Quinn Heavy Duty and Medium Duty Pipe Forms best for hand or wet process pipe. Give more years of service. All diameters—12 to 84 inches. Tongue and groove or bell end pipe, any length.

WRITE for New Book on Concrete Pipe giving information and prices, valuable tables on production costs, strength tests, Pipe Forms, Pipe Machines, etc. Book sent free.

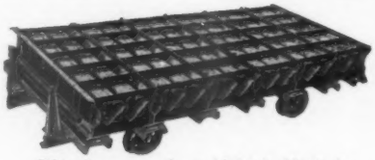
**QUINN WIRE & IRON WORKS** 1627 12 St. Boone, Iowa

## Heltzel
*BUILDS IT BETTER*

HELTZEL Bulk Cement storage and batching equipment—cost of cement from car to bin as low as 8/10 of a cent per barrel. Bulletin T-28.

**HELTZEL** STEEL FORM & IRON CO.
WARREN, OHIO, U.S.A.

## START A NEW BUSINESS



*This shows one of our Multiple Molds for casting 8x8x16" concrete blocks. We manufacture a complete line of Multiple Molds for blocks (both Rockface and plain), for brick, veneer blocks, etc. We are also owner and originator of the ZAGELMEYER SYSTEM of granite veneer for blocks.*

*Make*
**ZAGELMEYER**
*Waterproof Concrete Blocks*

***A Start May Be Made With as Little as $500.00***

The Zagelmeyer System produces a block that no other system can equal. Many good territories open. Write today for further information.

**Zagelmeyer Cast Stone Block Machinery Co.**
502 S. Henry St. BAY CITY, MICH.

# HELP YOURSELF TO TOP ECONOMY —PUT A FORD V·8 ON YOUR JOB!

**If you start reaching for the red ink when it comes time each month to tally up your hauling or delivery costs, it's time to change to Fords. The 1939 line of Ford V-8 Trucks and Commercial Cars hits high hauling costs right between the eyes. These modern units are built to give you the over-all economy that's so important in keeping costs down.**

**Any way you figure it, Ford performance adds up to money-saving performance. The original price tag is low. Insurance and license fees are low. Operating and up-keep costs are low. And so is depreciation.**

**On top of these savings, Ford gives you the tough, rugged construction that defies hard service — keeps your truck on the job.**

**Why not see how a Ford Truck fits into your hauling picture? Get in touch with any Ford dealer, and ask about an "on-the-job" test that will give you the facts before you buy.**

## FORD V·8 TRUCKS AND COMMERCIAL CARS

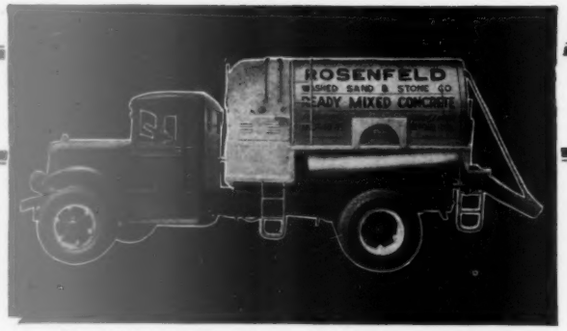
*Ford Motor Company • Builders of Ford V-8 and Mercury Cars, Ford Trucks, Commercial Cars, Station Wagons and Transit Buses*

### CHECK YOUR TRUCK AGAINST THESE QUALITY FORD FEATURES!

- ***V-8 Engines*** — 95, 85, 60 hp. Smooth, dependable, low-cost power. Quality materials and precision workmanship for efficient operation and long life.
- ***Semi-centrifugal Clutches*** — Non-tiring pedal action. Centrifugal force provides tremendous power-transmitting capacity. Up-keep costs kept at a minimum.
- ***Sturdy, Trouble-free Transmissions*** — Large roller and ball bearings for all forward speeds reduce friction, save power. Oil-hardened chromium-steel gears for long service.
- ***Full Torque-tube Drive***—Springs relieved of driving and braking stresses provide better cushioning of truck and its load. Shackle-bolt wear reduced, spring life prolonged.
- ***Rugged Rear Axles*** — Driving pinion is straddle-mounted to maintain gear tooth alignment. All truck axles are full-floating, with weight carried on axle housing — none on axle shafts. These features increase dependability and long service, reduce up-keep expense.
- ***Big, Powerful Hydraulic Brakes*** — Equalized braking action for straight stops. Big brake drum diameters and large lining areas for long brake life, low maintenance.

*In every detail, the quality of all Ford cabs and bodies matches the high quality of Ford chassis. Their exceptional durability means long service with low up-keep cost.*

KEEP YOUR AND MAKE MORE PROFITS




The Low Operating and Upkeep Costs

Ransome

**TRUCK MIXERS & AGITATORS**
***furnish***

a new way to overcome competition by enabling you to deliver a better mixed maximum strength, higher quality concrete at the lowest possible cost.

Write for the facts.

**RANSOME CONCRETE MACHINERY CO.**
DUNELLEN NEW JERSEY

**McCARTER**
**Asphalt Mixing Plants**
***APPROVED***

by an impressive roster of the country's leading contractors and asphalt concerns:—

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| A. Petrillo Company | Wilmington, Delaware |
| Highway Materials, Inc. | Bridgeport, Pa. |
| Wyoming Sand and Stone Company | Scranton, Pa. |
| Webb Asphalt Paving Company | New Haven, Conn. |
| Amiesite Corporation | Philadelphia, Pa. |
| Pittsburgh Asphalt Products Company | Pittsburgh, Pa. |
| Colprovia Asphalt Corporation | Staten Island, N. Y. |
| B. Turecamo Contracting Company | Brooklyn, N. Y. |
| Del Balso Asphalt Corporation | Bronx, N. Y. |
| Corson and Gruman Company, Inc. | Washington, D. C. |
| Suburban Construction Company | Ardmore, Pa. |
| Alan E. Barton | Baltimore, Maryland |

All of the above plants are approved by their respective states and municipal authorities.

*Write for Bulletin*

Designers and Manufacturers uninterruptedly since 1827

**McCarter Iron Works, Inc.**
Norristown Pennsylvania

**"COMMERCIAL"**
**CORED *Steel* PALLETS**

Lower priced than plain pallets.

Weigh less.

Easier to handle.

Better than cast iron.

Will not break, crack or warp.

Fit low cost machines—machine and pallet cost is less than some machines cost—do not let the one pallet for all styles of block deceive you in your costs.

Cores permit free air circulation.

Close clearance—fit the new vibrators.

*Ask us or your machinery maker.*

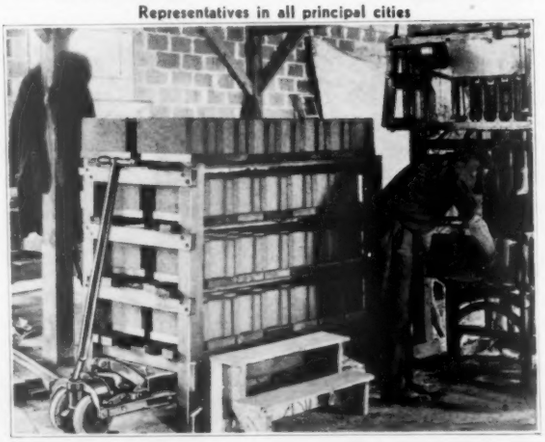
*The* COMMERCIAL SHEARING & STAMPING COMPANY
YOUNGSTOWN, OHIO.

**BARRETT LIFT-TRUCKS**
**ONE MAN HANDLES 48 BLOCKS**
**NO BREAKAGE**

Available for fifteen days free trial without obligating you to buy.

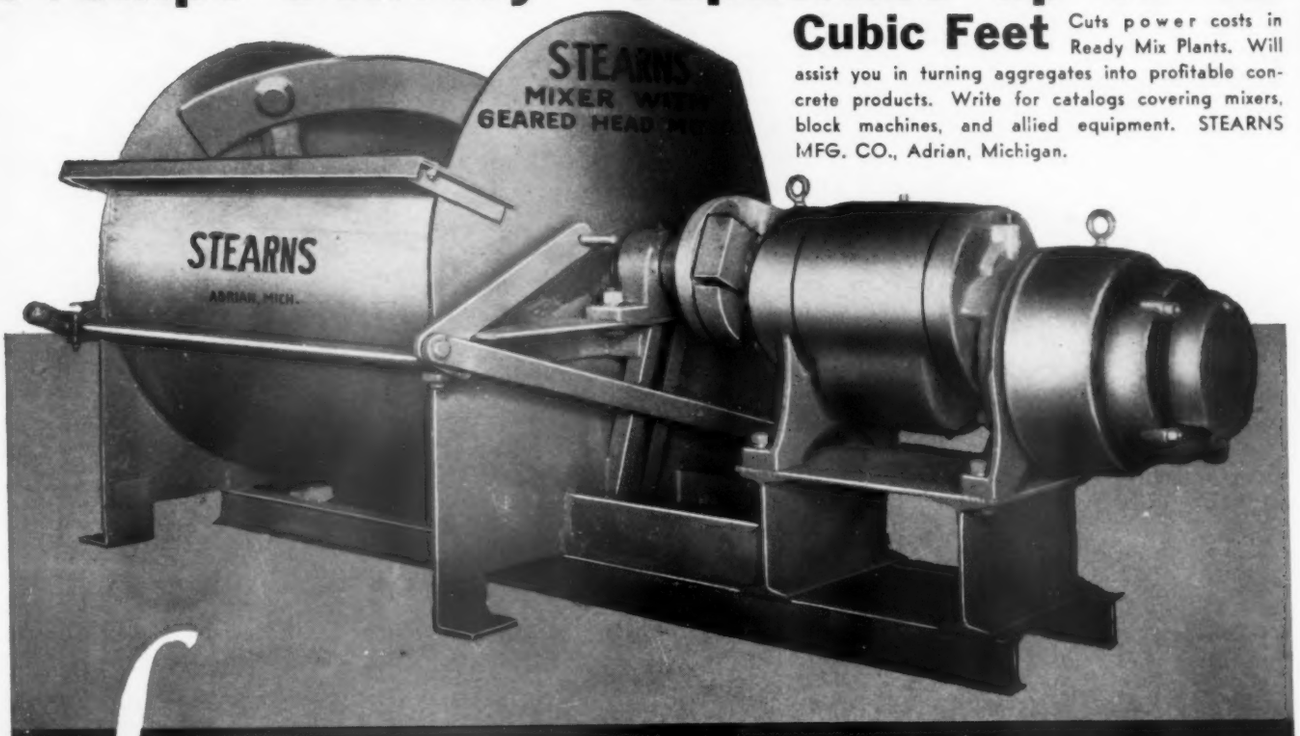
Handle your green concrete products the way that more than 800 other concrete products plants do. WITH BARRETT LIFT-TRUCKS EQUIPPED WITH A SUPER-SPRING FRAME AND RUBBER TIRES. Eliminate breakage—joggling out of shape and spoilage. Save time, money and labor by eliminating all unnecessary handling and breakage. Take your blocks direct from the machine to the curing room—with ease and dispatch. One man handles 48 blocks of the 8x8x16 size—or, 32 blocks of the 8x12x16 size.
Write for illustrated circular.

**BARRETT-CRAVENS COMPANY**
3251 West 30th Street CHICAGO, ILL.
Representatives in all principal cities



# Prompt Delivery — Capacities up to 42 Cubic Feet

Cuts power costs in Ready Mix Plants. Will assist you in turning aggregates into profitable concrete products. Write for catalogs covering mixers, block machines, and allied equipment. STEARNS MFG. CO., Adrian, Michigan.




*Stearns — the mixer with bar-type liners*

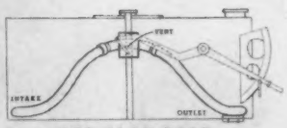
Blaw-Knox is the only manufacturer offering complete equipment for ready mixed concrete; including Trukmixers and Agitators, Ready Mixed Concrete Plants and Truck Mixer Loading Plants of all capacities and types.

Send for Blaw-Knox Catalogs Nos. 1566 and 1582.

BLAW-KNOX DIVISION of Blaw-Knox Company
FARMER'S BANK BUILDING PITTSBURGH, PA.

(11)

**BLAW-KNOX** *Truck Mixer* LOADING PLANTS




THE BLAW-KNOX WATER MEASURING SYSTEM

Tests show—only Blaw-Knox TKUKMIXERS have this accurate, practical, dependable water measuring system. Described in Bulletin No. 1643.

Buy Blaw-Knox Trukmixers. Get the advantage of automatic accurate water measurement, together with many other exclusive features.

20

**BLAW-KNOX** BLAW-KNOX DIVISION OF BLAW-KNOX CO Farmers Bank Bldg. Pittsburgh, Pa.
**TRUKMIXERS** *and Agitators*

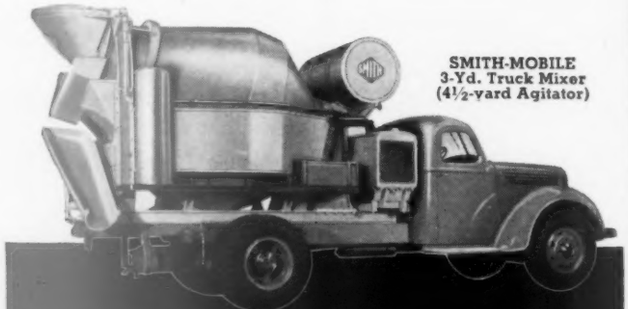
## . . . *the* CONCRETE *will not* SEGREGATE!

YOU get it with the SMITH-MOBILE, but not with any other truck mixer, a real CONTROLLED DISCHARGE. Open the door as wide as you want it. Then start and stop the drum with the pressure of one finger on the clutch lever. You can get a spoonful at a time if you want it — and with ABSOLUTELY NO SEGREGATION.

You can't get this valuable feature on any other truck mixer. But a slow, controlled discharge is positively necessary on nine out of ten jobs.

So why not buy a SMITH-MOBILE? Available now in 1½, 2, 3 and 4 yard sizes (2, 3, 4½ and 6 yards as agitators). Write for literature — today!

**THE T. L. SMITH COMPANY**
2887 N. 32nd STREET MILWAUKEE, WIS.



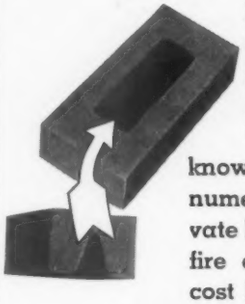
SMITH-MOBILE
3-Yd. Truck Mixer
(4½-yard Agitator)

**SMITH-MOBILE**
THE *Modern* TRUCK MIXER and AGITATOR

# WANTED ONE MAN IN EACH COMMUNITY

Modern engineering has revolutionized the manufacture and distribution of a basic commodity in daily use by the building industry. This has opened up new profit opportunities for aggregate producers to dominate their local markets manufacturing exclusive products utilizing about 90% of their aggregate as raw material.

## THE PRODUCT

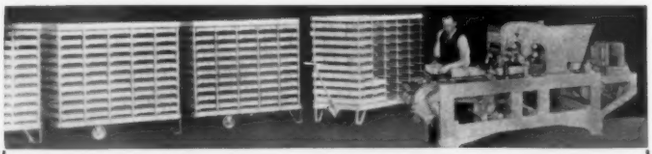


Proven by actual use throughout the world. Vastly improved in design and quality, unsurpassed in beauty. Over 40 colors, shades and textures. Quality beyond any known building requirement proven by numerous Federal, municipal and private laboratory tests. Offers permanent, fire and vermin proof construction at cost level of frame.

## THE BUSINESS

Already proven successful beyond anticipation by present aggregate producers. Equipped with our automatic machinery—large production—one or two men. Only moderate investment required. Franchise granted protecting your market, business and future.

INVESTIGATE — while your territory is still open. Fill in and return coupon today. No obligation.



W. E. DUNN MFG. CO.,
420 W. 24th St.,
Holland, Michigan

**"Show Me" Coupon**

☐ Show me through your free books about the product, the business and the earning power of an exclusive plant in my territory.

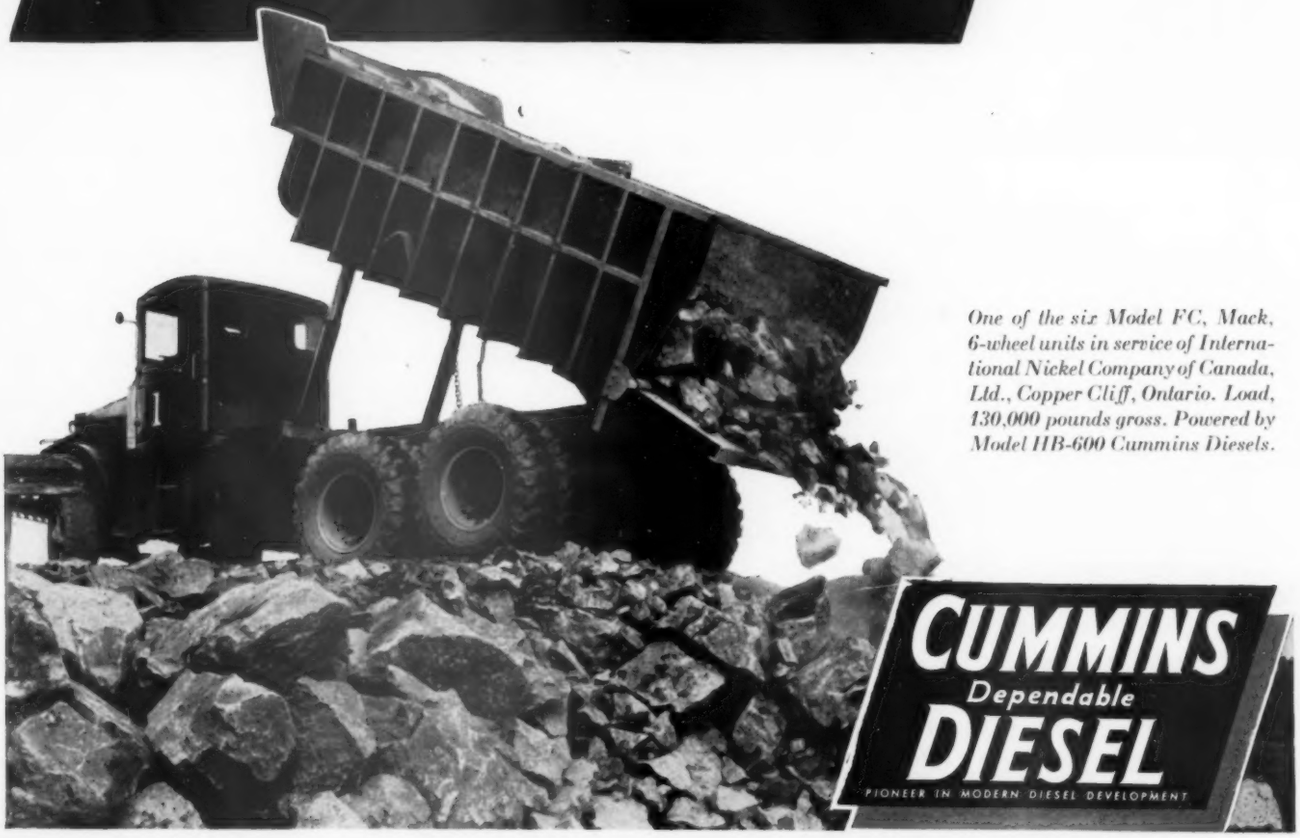
Name .....

Address .....

City ..... State .....

# The Biggest Profit is NOT its fuel Economy

Important as it may seem . . . fuel economy is *not the biggest profit* which accrues to owners of Cummins Dependable Diesels. Unless you *know* Cummins dependability, you will miss its biggest savings. ¶ One power failure can eat up the fuel savings on a dozen units. Behind the Cummins Dependable Diesel is a seven-year record for unfailing, day-after-day performance . . . a record that assures cheap dirt. ¶ With Cummins Dependable Diesels you can substitute certainty for hope . . . proof for expectancy . . . but be careful when you bid against Cummins Dependable Diesels. Cummins Engine Co., 3816 Wilson St., Columbus, Ind.



*One of the six Model FC, Mack, 6-wheel units in service of International Nickel Company of Canada, Ltd., Copper Cliff, Ontario. Load, 130,000 pounds gross. Powered by Model HB-600 Cummins Diesels.*

**CUMMINS**
Dependable
**DIESEL**
PIONEER IN MODERN DIESEL DEVELOPMENT

# YOU WOULDN'T USE LOCOMOTIVE OIL FOR A WRIST WATCH!

## WIRE ROPE, too, requires a proper lubricant!

HAVE YOU ever stopped to think that WIRE ROPE IS A MACHINE WITH MANY BEARINGS! In the average single length of wire rope there are thousands of wearing surfaces—where wire moves against wire.

Only the right kind of lubricant, properly applied, will not only protect the outer surface of the rope—but also get down below the surface, to keep those internal rope-wire "bearings" from wearing out or corroding.

Lubrication at correctly determined intervals, with the *right* wire rope lubricant, maintains rope safety—lengthens rope life.

For full information regarding a wire rope lubricant exactly suited to your own particular equipment and operating conditions, consult the nearest Roebling office.

---

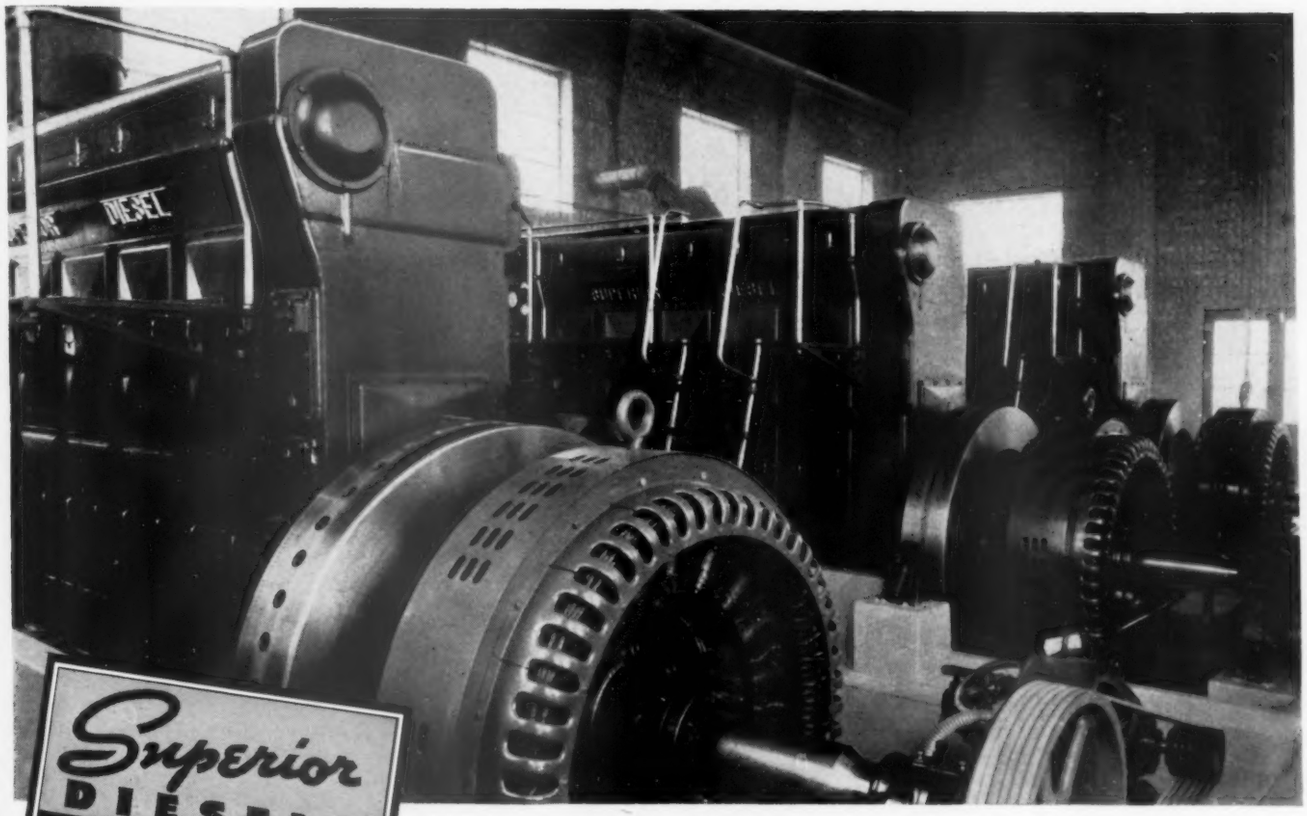
*This advertisement is published in the interest of all wire rope users, to help them obtain greater safety, service, and efficiency from their wire rope.*

*Enjoy these advantages of proper wire rope lubrication:*

1. Maintenance of rope safety
2. Longer rope life
3. Less wear on drums and sheaves
4. Increased operating efficiency

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY BRANCHES IN PRINCIPAL CITIES

# FOR LOW COST POWER
## 3 SUPERIORS at Electra, Texas




Three 5-cylinder, 350 H.P. Superior Engines recently installed.

AMONG the great number of users of Superior engines are many who have 3, 4, 5 or more engines in one or more plants, thus testifying to the exceptional value and merit of these modern power units and the careful engineering and honest representation of savings by which they are sold.

Don't let high power cost call "three strikes" on you without even investigating what Superior Diesels may do! An inquiry does not obligate. Ask for references in your own industry.

**THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION**

FACTORIES: Springfield, Ohio; Philadelphia, Pa. · SALES OFFICES: Springfield, Ohio; Philadelphia, Pa.; New York, N. Y.; Los Angeles, Calif.; Houston, Texas.

## You can get TWICE the Production WITH 1/4 YOUR PRESENT TRUCKS

You can eliminate 75 per cent of your heavy investment in trucks with the Brooks Load-Lugger, wherever loading is done by hand. Decrease truck operating costs . . . eliminate wasted standing idle time. ONE Load-Lugger and 4 to 8 Load-Lugger Buckets can do the work of a number of trucks . . . with far greater production and at much less cost. Write for the complete cost-cutting story. Demonstrations arranged in most sections.

**BROOKS EQUIPMENT & MFG. CO.**
**97 Davenport Road, Knoxville, Tenn.**

## THE STRONG SCOTT MFG. CO.
MINNEAPOLIS, MINN.

*Manufacturers of*

UNIT PULVERIZERS
for
DIRECT-FIRING KILNS,
DRYERS AND BOILERS

ROL-MAN
TRUE MANGANESE STEEL

## screens

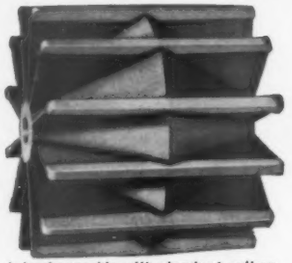
Highest abrasion resistance of any known steel. Double Lock Mesh Weave perpetuates initial accuracy for the life of the screen. Send for prices and performance facts.

MANGANESE STEEL FORGE CO., CASTOR AVE. & ALLEN ST., PHILA., PA.

CONVEYING SYSTEMS FOR PULVERIZED, FINE, CRUSHED & GRANULAR MATERIALS
FULLER-KINYON—FLUXO—AIRVEYOR
ROTARY FEEDERS - DISCHARGE GATES
FULLER ROTARY COMPRESSORS AND VACUUM PUMPS
AUTOMATIC BATCH WEIGHERS
BIN SIGNALS

**FULLER COMPANY**
CATASAUQUA, PENNSYLVANIA
Chicago: Marquette Bldg. San Francisco: Chancery Bldg.

## RAISE THE AGE LIMIT ON BELTS



Interchangeable with standard pulleys.

Sprout-Waldron WING Pulleys will lengthen the service life of belts beyond the usual "retirement age." Designed for smooth pull, with minimum wear. Especially recommended on elevators and conveyors carrying stone, ore and other hard products. Wing design prevents material handled from lodging between belt and pulley and damaging belt.

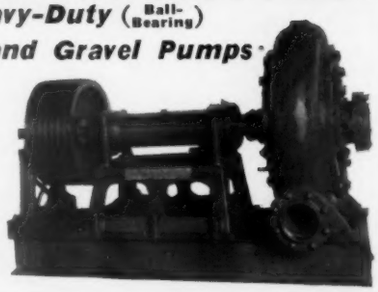
**Write for catalog**

**SPROUT, WALDRON & CO., INC.**
**1221 Sherman St., Muncy, Pa.**
Manufacturers of Labor-Aiding, Profit-Producing Machinery Since 1866

## LIGHTNING

***Heavy-Duty*** (Ball-Bearing)
***Sand and Gravel Pumps***

High efficiency—low operating cost—precision workmanship—wear-resisting, non-heating bearings even when operated under extremely high heads. WRITE

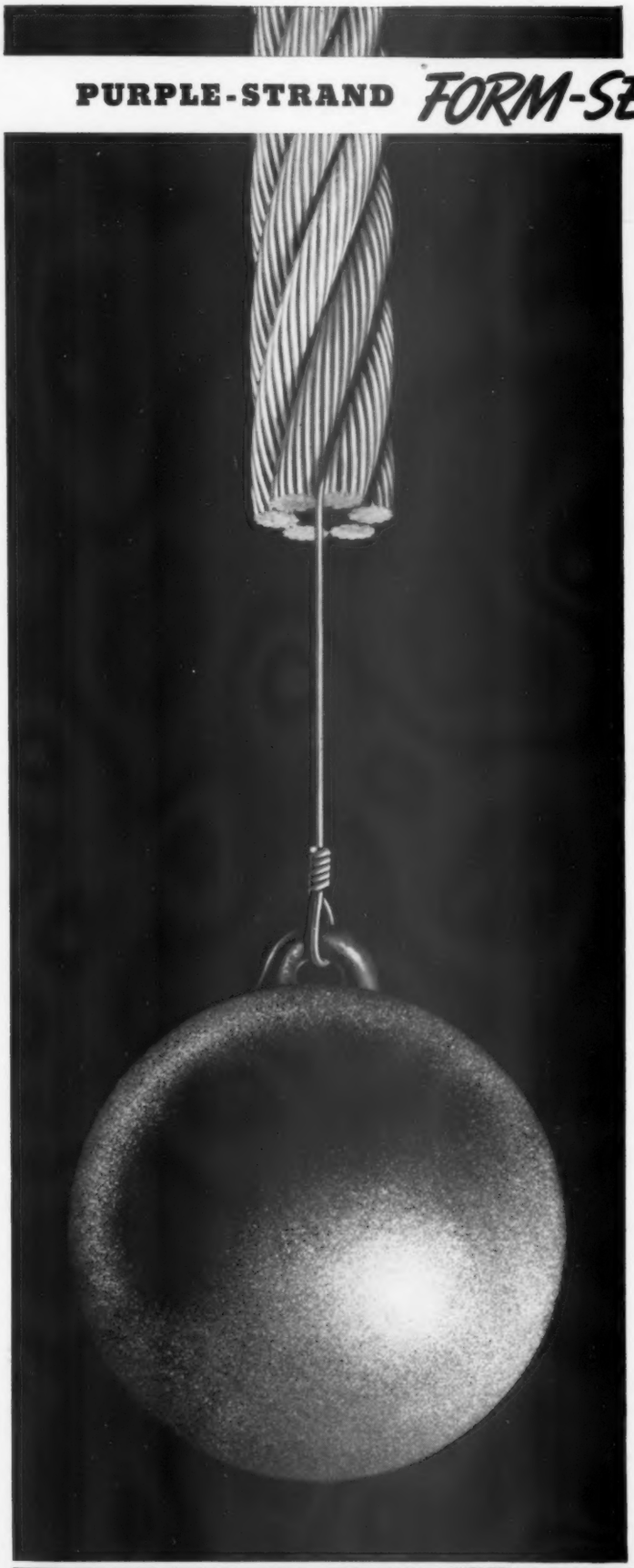


**KANSAS CITY HAY PRESS CO.**
KANSAS CITY, MO.

ROUND
SQUARE
SQUAROUND*
HEXAGON
**PERFORATED PLATE**
of every description
for maximum productiveness from your vibrating screens.
*Reg. U.S. Pat. Off.

**HENDRICK MANUFACTURING CO.**
39 Dundaff Street, Carbondale, Pa.
*Sales Offices in Principal Cities. Please Consult Telephone Directory*

**PURPLE-STRAND *FORM-SET* WIRE ROPE**



# Made of premium-price extra-tough steel

EVERY pound of steel that goes into Purple-Strand rope would command an extra price on the open market, for extra care and extra time are required in steel-making departments to produce this metal. Special furnaces, reserved for the out-of-ordinary job, are used. Special practices, carried out under strict metallurgical observation, are observed at these furnaces, at the soaking pits, and in the rolling mills.

The result is a superior steel, the first requirement for superior rope. This steel, drawn into wire, has more than four times the strength of structural steel. It has a toughness far exceeding any ordinary steel. Its fatigue resistance is exceptional. And above all, because of close control and a strict schedule of testing, these qualities are the same in mile after mile of wire.

Purple-Strand quality, however, does not end with the premium-price steel. Every step in the making of a Purple-Strand wire rope involves extra skill and attention. For example, design has been perfected until this line is a real precision machine. Lubrication has been studied and special lubricants developed. Every conceivable step has been taken to make Purple-Strand Form-Set the finest wire rope money can buy.

Bethlehem wire rope is available through distributors. Write Bethlehem Steel Company, Bethlehem, Pa., for the names of wire-rope distributors in your vicinity.

**BETHLEHEM STEEL COMPANY**

# BUYERS' GUIDE

A Directory of Pit and Quarry Advertisers Indexed According to Product.

**Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified.**

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*Lima Locomotive Works
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*Smidth & Co., F. L.
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*Traylor Engr. & Mfg. Co.

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**Belt Lacing**
Flexible Steel Lacing Co.

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*Robins Conveying Belt Co.
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Sprout, Waldron & Co.

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*Austin-Western Road Machy. Co.
*Blaw-Knox Co.
*Chicago Bridge & Iron Co.
*Diamond Iron Works
*Erie Steel Construction Co.
Heltzel Steel Form & Iron Co.
*Hendrick Mfg. Co.
Hetherington & Berner, Inc.
*Link-Belt Co.
Manganese Steel Forge Co.
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National Powder Co.

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*Ensign-Bickford Co.
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**Block Machines (Concrete)**
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*Kent Machine Co.
*Multiplex Concrete Machinery Co.
*Stearns Mfg. Co.
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Anchor Concrete Machy. Co.
Dunn Mfg. Co., W. E.
*Kent Machine Co.
*Multiplex Concrete Machinery Co.
*Stearns Mfg. Co.
Zagelmeyer Cast Stone Block Machy. Co.

**Blocks (Sheave)**
*Haiss Mfg. Co., Geo.
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*Blaw-Knox Co.
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Ransome Concrete Machinery Co.
*Smith Co., T. L.

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Commercial Shearing & Stamping Co.
Easton Car & Constr. Co.

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**Brick Machines (Concrete)**
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*Stearns Mfg. Co.

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*Stearns Mfg. Co.

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*Blaw-Knox Co
*Erie Steel Construction Co.
Frog, Switch & Mfg. Co.
*Haiss Mfg. Co., Geo.
Industrial Brownhoist Corp.
*Link-Belt Co.
Owen Bucket Co.
Wellman Engineering Co.

**Buckets (Dragline—Cableway)**
*Bucyrus-Erie Co.
*Erie Steel Construction Co.
*Link-Belt Co.
Page Engineering Co.
*Sauerman Bros., Inc.
Wellman Engineering Co.

**Buckets (Dump)**
*Brooks Equip. & Mfg. Co.
*Dempster Bros. Inc.
*Jaeger Machine Co.

**Buckets (Elec. Heated, Weighing)**
Easton Car & Constr. Co.
McCarter Iron Works, Inc., The

**Buckets (Elevator and Conveyor)**
Chicago Steel Fdry. Co.
*Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
Industrial Brownhoist Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
Manganese Steel Forge Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

**Buggies (Dump)**
*Koehring Co.
*LeTourneau, Inc., R. G.

**Bulk-Cement Storage Plants**
*Chicago Bridge & Iron Co.
Heltzel Steel Form & Iron Co.
McCarter Iron Works, Inc., The
Sprout, Waldron & Co.

**Bulldozers**
*LeTourneau, Inc., R. G.

**Cableways**
*American Steel & Wire Co.
Bethlehem Steel Co.
Page Engineering Co.
*Roebling's Sons Co., John A.
*Sauerman Bros., Inc.

**Caps (Blasting)**
Atlas Powder Co.
National Powder Co.

**Caps (Blasting, Electric)**
Atlas Powder Co.
National Powder Co.

**Capstans** (See Winches and Capstans)

**Car Dumpers**
*Link-Belt Co.
Wellman Engineering Co.

**Car Pullers**
*Link-Belt Co.

**Car Wheels** — (See Wheels — Car)

**Carriers**
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

**Carryalls**
*Austin-Western Road Machy. Co.
*Koehring Co.
*LeTourneau, Inc., R. G.

**Cars (Block, Concrete)**
*Link Belt Co.
*Multiplex Concrete Machinery Co.

**Cars (Industrial)**
Easton Car & Constr. Co.

**Cars (Quarry & Gravel Pit)**
*Austin-Western Road Machy. Co.

**Castings**
Alloy Steel & Metals Co.
Chicago Steel Fdry. Co.
*Eagle Iron Works
Frog, Switch & Mfg. Co.
*Hardinge Co.
Hetherington & Berner, Inc.
*Link-Belt Co.
McLanahan & Stone Corp.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

**Cement Pumps** (See Pumps; Air Pumps; Pumps, Cement Slurry; Pumps, Bulk Cement)

**Central Concrete Mixing Plants (Comp.)**
*Erie Steel Construction Co.
Heltzel Steel Form & Iron Co.
*Jaeger Machine Co.
McCarter Iron Works, Inc., The
Sprout, Waldron & Co.

**Chain (Dredge and Shovel)**
Manganese Steel Forge Co.

**Chain Drives**
*Link-Belt Co.

**Chain (Elevating and Conveying)**
*Haiss Mfg. Co., Geo.
*Link-Belt Co.
Manganese Steel Forge Co.
*McLanahan and Stone Corp.
Sprout, Waldron & Co.

**Chutes and Chute Liners**
Frog, Switch & Mfg. Co.
*Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
McCarter Iron Works, Inc., The
McLanahan and Stone Corp.
*Robins Conveying Belt Co.
*Smidth & Co., F. L.
Sprout, Waldron & Co.

**Classifiers**
Bendelari, F. N.
*Deister Machine Co.
*Hardinge Co.
Lewistown Foundry & Machine Co.
*Link-Belt Co.
*Nordberg Mfg. Co.
Simplicity Engineering Co.
Straub Mfg. Co.

**Clips (Wire Rope)**
*American Steel & Wire Co.
Bethlehem Steel Co.
*Roebling's Sons Co., John A.

**Clutches**
*Link-Belt Co.
Sprout, Waldron & Co.

**Coal-Pulverizing Equipment**
*Hardinge Co.
*Raymond Pulverizer Division of the Combustion Engineering Co.
*Smidth & Co., F. L.
Strong-Scott Mfg. Co.
*Traylor Engr. & Mfg. Co.
*Williams Patent Crusher & Pulverizer Co.

**Compressors** (See Air Compressors)

**Concentrators (Slurry)**
*Deister Concentrator Co.

**Concrete Breakers (Air)**
Gardner-Denver Co.

* See also information in the 1939 Pit and Quarry HANDBOOK.

# ASPHALT PLANTS

HOT & COLD MIX—ANY CAPACITY
PORTABLE OR STATIONARY
STEAM — ELECTRIC OR DIESEL

THE SIMPLICITY SYSTEM COMPANY
CHATTANOOGA, TENNESSEE

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**Performance, Economy, Dependability, and Sturdiness constitute the foundation upon which Sterling has built its reputation as a superior motor truck. Sterling motor trucks have been adopted by leading contractors everywhere who demand unfaltering service, large payloads, and low operating costs. Because Sterlings are built to meet your operating conditions, you are assured long, dependable service and greater profits.**

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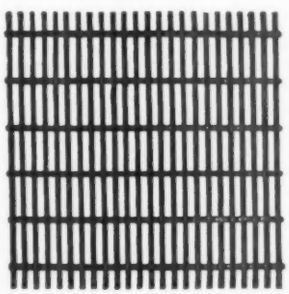
**MILWAUKEE, WIS.**
*Factory Branches in Principal Cities*



Rolled Slot

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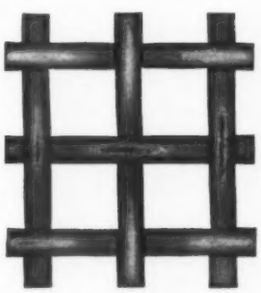
A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

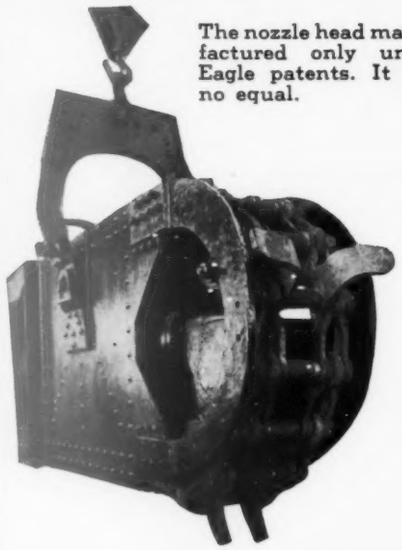
Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

**THE CLEVELAND WIRE CLOTH & MFG. COMPANY**
**574 E. 78th St.** **CLEVELAND, OHIO**

# EAGLE
## "SWINTEK" SCREEN NOZZLE LADDER



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## EAGLE IRON WORKS

**129 Holcomb Ave., Des Moines, Iowa**


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*Chicago Bridge & Iron Co.
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*Robins Conveying Belt Co.
Sprout, Waldron & Co.

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*Link-Belt Co.
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*Smidth & Co., F. L.

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*Robins Conveying Belt Co.
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*Bay City Shovels, Inc.
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*Bucyrus-Erie Co.
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*American Pulverizer Co.
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*American Pulverizer Co.
*Austin-Western Road Machy. Co.
*Brooks Equip. & Mfg. Co.
*Dixie Machy. Mfg. Co.
*Gruendler Crusher & Pulverizer Co.
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Straub Mfg. Co.
*Williams Patent Crusher & Pulverizer Co.

**Crushers (Jaw and Gyratory)**
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*Austin-Western Road Machy. Co.
Bacon, Inc., Earle C.
Brooks Equip. & Mfg. Co.
*Diamond Iron Works
*Gruendler Crusher & Pulverizer Co.
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*McLanahan and Stone Corp.
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*Nordberg Mfg. Co.
Rogers Iron Works
Smith Engr. Works
Straub Mfg. Co.
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**Crushers (Ring)**
*American Pulverizer Co.
*Williams Patent Crusher & Pulverizer Co.

**Crushers (Roll)**
*American Pulverizer Co.
*Austin-Western Road Machy. Co.
*Brooks Equip. & Mfg. Co.
*Diamond Iron Works
*Gruendler Crusher & Pulverizer Co.
*Link-Belt Co.
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*Robins Conveying Belt Co.
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*Williams Patent Crusher & Pulverizer Co.

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*American Pulverizer Co.
*Austin-Western Road Machy. Co.
New Holland Machine Co.
*Williams Patent Crusher & Pulverizer Co.

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Alloy Steel & Metals Co.
*Austin-Western Road Machy. Co.
Frog, Switch & Mfg. Co.
*Link-Belt Co.
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New Holland Machine Co.
Rogers Iron Works
Straub Mfg. Co.
*Traylor Engr. & Mfg. Co.
*Williams Patent Crusher & Pulverizer Co.

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Atlas Powder Co.
National Powder Co.

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* See also information in the 1939 Pit and Quarry HANDBOOK.

**Dippers and Teeth (Power Shovel)**
*Bucyrus-Erie Co.
Frog, Switch & Mfg. Co.
*Koehring Co.

**Dragline Cableway Excavators**
*Bucyrus-Erie Co.
*Link-Belt Co.
Page Engineering Co.
*Sauerman Bros., Inc.

**Dragline Excavators**
*Austin-Western Road Machy. Co.
*Bay City Shovels, Inc.
Buckeye Traction Ditcher Co.
*Bucyrus-Erie Co.
*Erie Steel Construction Co.
Industrial Brownhoist Corp.
*Koehring Co.
Lima Locomotive Works
*Link-Belt Co.
Marion Steam Shovel Co.
Northwest Engineering Co.
Page Engineering Co.
Thew Shovel Co.

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*Bucyrus-Monighan Co.

**Dredges**
*Bucyrus-Erie Co.
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*Morris Machine Works

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*Chicago Bridge & Iron Co.
Cummer & Son Co., The F. D.
*Hardinge Co.
Lewistown Fdry. & Machine
*Link-Belt Co.
McCarter Iron Works, Inc., The
McLanahan & Stone Corp.
*Traylor Eng. & Mfg. Corp.
Tyler Co., W. S.

**Drill Bit Reconditioning**
*Bucyrus-Erie Co.

**Drill Bit Sharpeners**
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**Drill Sharpening Machinery**
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**Drilling Accessories**
*Bucyrus-Erie Co.
Gardner-Denver Co.

**Drilling Contractors**
Hoffman Bros. Drilling Co.
Pennsylvania Drilling Co.

**Drills (Blast-Hole)**
*Bucyrus-Erie Co.
Gardner-Denver Co.

**Drills (Core)**
Hoffman Bros. Drilling Co.
Pennsylvania Drilling Co.

**Drills (Diamond)**
Hoffman Bros. Drilling Co.
Pennsylvania Drilling Co.

**Drills (Drifting)**
Gardner-Denver Co.

**Drills (Hand-Hammer)**
Gardner-Denver Co.

**Drills (Rock)**
Gardner-Denver Co.

**Drills (Sinking)**
Gardner-Denver Co.

**Drills (Stoping)**
Gardner-Denver Co.

**Drills (Wagon)**
*Bucyrus-Erie Co.
Gardner-Denver Co.

**Drills (Water Well)**
*Bucyrus-Erie Co.

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*Link-Belt Co.

**Dust Arresters**
*Blaw-Knox Co.
*Research Corp.
*Sly Mfg. Co., W. W.
*Western Precipitation Corp.

**Dust Collecting Systems**
*Blaw-Knox Co.
McCarter Iron Works, Inc., The
*Raymond Pulverizer Division of the Combustion Engineering Co.
*Research Corp.
*Sly Mfg. Co., W. W.
*Western Precipitation Corp.

**Dust Conveying Systems**
Allen-Sherman-Hoff Co.
*Blaw-Knox Co.
*Fuller Company
*Research Corp.
*Sly Mfg. Co., W. W.
*Western Precipitation Corp.

**Dust Filters**
*Research Corp.
*Sly Mfg. Co., W. W.
*Western Precipitation Corp.

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**Electrodes (Welding)**
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Wall-Colmonoy Corp.

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**Engineers**
Bacon, Inc., Earle C.
*Fuller Company
Hetherington & Berner, Inc.
Lime & Hydrate Plants Co.
McLanahan and Stone Corp.
*Robins Conveying Belt Co.
*Smidth & Co., F. L.
Sprout, Waldron & Co.
Strong-Scott Mfg. Co.
*Traylor Engr. & Mfg. Co.
Wellman Engineering Co.

**Engine Generator Sets**
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**Engines (Diesel)**
Caterpillar Tractor Co.
Cummins Engine Co.
National Supply Co. of Del.
*Nordberg Mfg. Co.
Page Enginering Co.
Superior Diesel Engine Division of the National Supply Co.

**Engines (Internal-Combustion)**
Caterpillar Tractor Co.
Cummins Engine Co.
National Supply Co. of Del.
*Nordberg Mfg. Co.
Page Engineering Co.
Superior Diesel Engine Division of the National Supply Co.

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*Nordberg Mfg. Co.

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**Excavators—Shallow Grading (Bucket Elevator Type)**
*Haiss Mfg. Co., Geo.

**Explosives**
Atlas Powder Co.
National Powder Co.

**Fabricating (Electric Arc and Oxy-Acetylene)**
Manufacturer's Steel Supply Co.

**Feeders**
*Diamond Iron Works
*Fuller Company
*Hardinge Co.
*Link-Belt Co.
McCarter Iron Works, Inc., The
*McLanahan and Stone Corp.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.
Straub Mfg. Co.
*Traylor Engr. & Mfg. Co.

**Forges (Oil)**
Gardner-Denver Co.

**Fuses (Detonating)**
Atlas Powder Co.
*Ensign-Bickford Co.
National Powder Co.

**Gas Producers**
Wellman Engineering Co.

**Gaskets**
Quaker City Rubber Co.

**Gasoline Engines (See Engines—Internal-Combustion)**

**Gates (Bin) (See Bin Gates)**

**Gates (Clamshell)**
*Haiss Mfg. Co., Geo.
*Link-Belt Co.

**Gears (Herringbone)**
*Link-Belt Co.
Sprout, Waldron & Co.

* See also information in the 1939 Pit and Quarry HANDBOOK.


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LINK-BELT *Vibrating* SCREENS

INSURE DRASTIC SAVINGS in Your HAULAGE OPERATIONS

A DAVENPORT INDUSTRIAL LOCOMOTIVE gives you flexible, smooth performance and easy handling *plus* important fuel economy and many-year dependability. Cut your costs and boost your profits the "Davenport Way."

These modern units are available in many types from 2½ to 100 tons. May we suggest that you submit your requirements. Our engineers will gladly develop dependable recommendations at no cost to you. You'll be surprised to know how much your Davenport can save for you. DAVENPORT LOCOMOTIVE WORKS (A Division of Davenport Besler Corporation), Davenport, Iowa.

*Write TODAY for Descriptive Catalog*

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DAVENPORT — Builders of the World's Industrial Locomotives — DAVENPORT LOCOMOTIVE WORKS

GASOLINE • DIESEL • STEAM
DIESEL ELECTRIC • GAS ELECTRIC

# BUYERS' GUIDE

A Directory of Pit and Quarry Advertisers Indexed According to Product.

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*Hardinge Co.
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*National Wire Cloth Co.

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*Jaeger Machine Co.
*Koehring Co.

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*Multiplex Concrete Machinery Co.
*Stearns Mfg. Co.
Zagelmeyer Cast Stone Block Machy. Co.

* See also information in the 1939 Pit and Quarry HANDBOOK.

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For many years, Traylor lime manufacturing equipment has been very highly regarded in the industry, due to its years-ahead design, unquestioned efficiency and entire reliability. Many prominent plants engaged in the production of lime for the market, as well as for consumption in chemical manufacture, testify to these facts.

Whether it be crushers for primary breaking or reducing the rock to kiln size, or dryers, kilns and coolers for making or recovering lime, Traylor equipment is most economical and profitable to use. Whatever your problem may be, consultation with us will solve it immediately in a satisfactory manner. Write us today!

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B. C. EQUIPMENT CO., LTD., Vancouver, B. C., Canada

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## WHY 3 COMPANIES — *A Crushing Plant and Two Cement Mills* — INSTALLED SLY DUST FILTERS

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*** To Eliminate the Dust Nuisance**

". . . the dust nuisance was the first consideration in making these installations and we are very well satisfied with the results."

2

*** For Better Relations With Workers**

". . . we have found that, when the workers recognize the desire of the management to provide them with clean, healthy working areas, they immediately show a greater interest in their work, and in maintaining the premises clean and the equipment in working order."

3

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". . . our decision to install collectors at our various plants was brought about more by the desire to clean up the plants and improve conditions in general, and I might say that wherever we have made installations we have accomplished all that we set out to do. All our plant superintendents are very well satisfied with your installations and as you know, we are again installing a number of your collectors this winter, which should be pretty good evidence that we thoroughly believe in them."

Sly Dust Control is *not* expensive—it's a paying investment—ask for bulletin P-90—Dust Control.

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4745 Train Avenue — Cleveland, Ohio

Branch Offices in Principal Cities

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*Link-Belt Co.

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Hetherington & Berner, Inc.
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*Sauerman Bros., Inc.

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*Kent Machine Co.
*Multiplex Concrete Machinery Co.
*Stearns Mfg. Co.
Zagelmeyer Cast Stone Block Machy. Co.

**Tanks**
*Chicago Bridge & Iron Co.
Heltzel Steel Form & Iron Co.
*Hendrick Mfg. Co.
*Link-Belt Co.
McCarter Iron Works, Inc., The
*Traylor Engr. & Mfg. Co.

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*Chicago Bridge & Iron Co.

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Sterling Motor Truck Co.

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*American Steel & Wire Co.
Bethlehem Steel Co.
*Roebling's Sons Co., John A.

**Transmission Belting (See Belting)**

* See also information in the 1939 Pit and Quarry HANDBOOK.

# WILLIAMS *Buckets*

**Built by WELLMAN**
***Built to Last— and Move Dirt Fast***

● Profits from a digging or material handling job often depend on how fast the crane operator can move dirt and materials. That's when Williams Buckets prove their advantages. Their tremendous digging power and ability to stand up do not rely on cumbersome weight and massive construction. No "dead-head" metal rides in Williams Buckets—you carry maximum yardage in every swing, utilizing the full capacity and range of your crane to move pay-dirt—not inert metal.

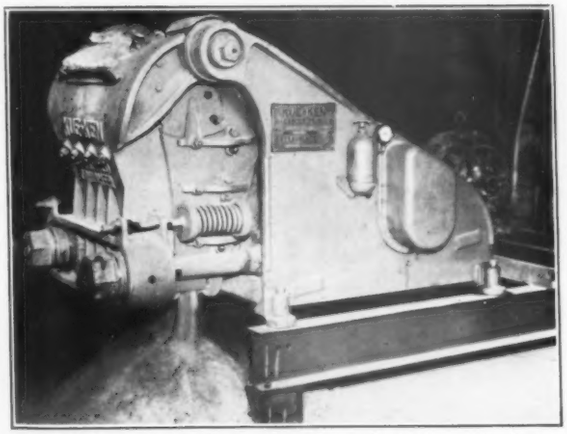
Send for free bulletins covering the Williams line of Power-Arm, Multiple-Rope, Power-Wheel, Hook-On and Dragline Buckets. Distributors located in all parts of the country for prompt field service.

**THE WELLMAN ENGINEERING CO.**
7014 CENTRAL AVENUE
CLEVELAND, OHIO

★ *Help Cranes Do Their Best Work!* ★

# MORE JOBS FOR YOU

## WHEN YOU MAKE YOUR CRUSHED ROCK WITH A KUE-KEN BALANCED CRUSHER (NEW CRUSHING PRINCIPLE)



KUE-KEN crusher under load. All mechanism runs in dust-tight filtered oil bath. Several sizes available for primary, secondary or "single pass" crushing.

Cheaper rock allows you to bid lower and get jobs you've been losing out on. KUE-KEN crushers are the **only** machines that will crush large rocks fine in a "single pass." The jaws may be quickly adjusted for primary crushing. **No other crusher** has this new and better principle of crushing without abrasion or rubbing.

We are now building several crushers for men "from Missouri." They came to our plant and saw a KUE-KEN crusher crushing without abrasion, without foundations. They checked capacities with stop watches. These "hard boiled" crusher men were so convinced by the actual performance that they ordered at once. To those of you who are unable to come and see, we ask you to write and make us **prove** that a KUE-KEN crusher does give cheaper crushed rock.

**SEND FOR BULLETIN NO. 600 TODAY**

**STRAUB MFG. CO.** 528 CHESTNUT STREET OAKLAND, CALIFORNIA

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Barrett-Cravens Co.

**Tubes for Tire Casing**
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*Hendrick Mfg. Co.
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*Tyler Co., W. S.

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*Multiplex Concrete Machy. Co.
*Stearns Mfg. Co.

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*Eagle Iron Works
*Haiss Mfg. Co., Geo.
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McLanahan and Stone Corp.
*Smidth & Co., F. L.
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*Traylor Engr. & Mfg. Co.
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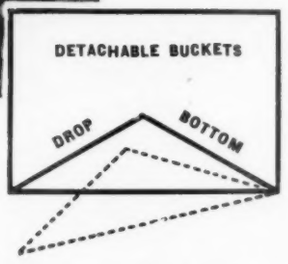


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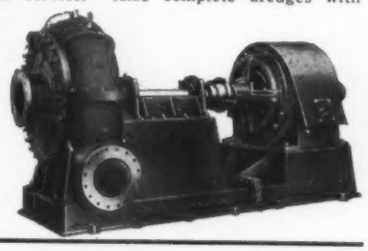

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★ Wears five times as long as cloth made of ordinary steel.
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★ Maintains accuracy throughout life of screen.
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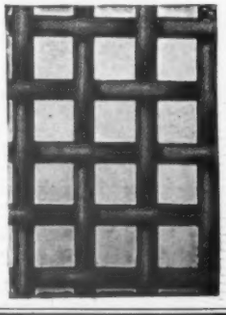

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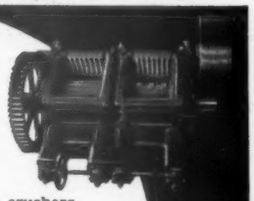
**for ROCK—SAND—GRAVEL**



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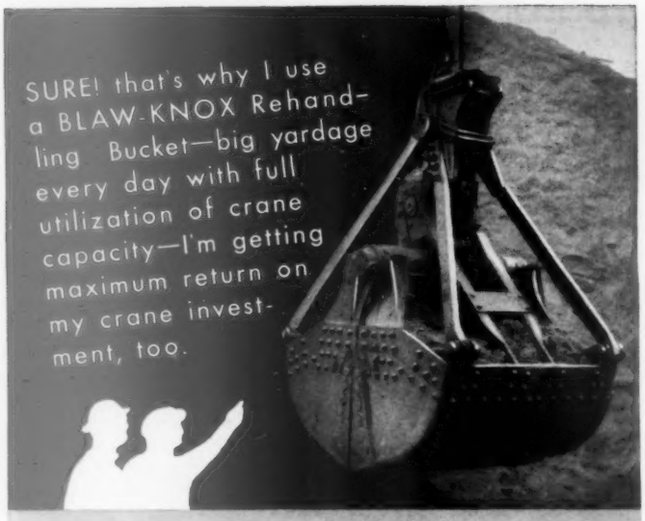
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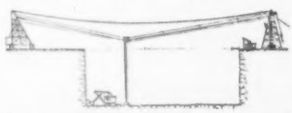

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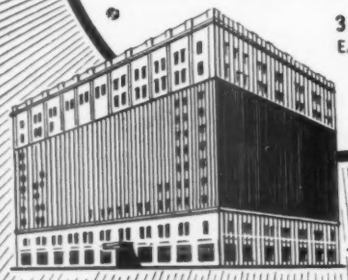

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LINK-TYPE
½ to 15 Yards Capacity

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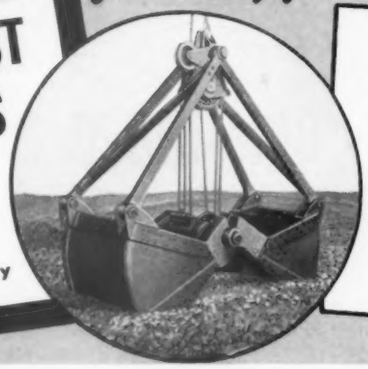

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HEAVY SOLUTION TESTS WILL PREDETERMINE WHAT IMPURITIES CAN BE ELIMINATED

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Use the correct basic principle of Positive Eccentric Action, produced by a solid shaft with the counterbalance machined directly thereon, an exclusive patented Simplicity feature.

Other Simplicity features are the special rubber corner supports, screen cloth in tension four ways over a doubly crowned screen deck, and sturdy all steel construction with each machine finished in every detail.

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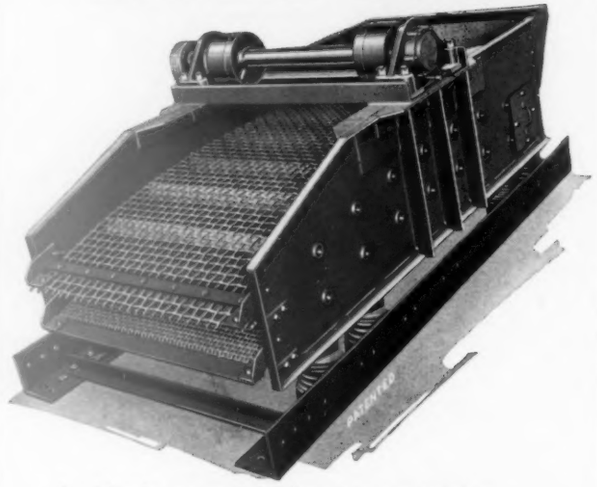

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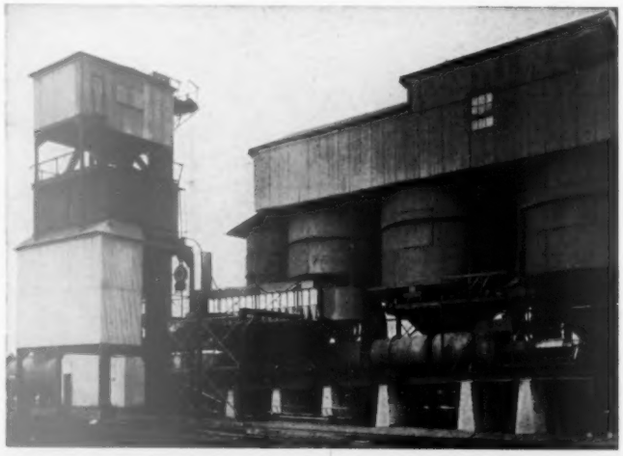

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CAPACITY DESIGN AND ARRANGEMENT TO MEET ANY REQUIREMENTS

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**1—4′x4′ Ball Mill.**
New Dryers built for all purposes.

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1—150 HP Fairbanks-Morse, style Y, type V Diesel Engine complete with starting equipment.
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2—100 HP Tipps Diesel Engine.
1—200 HP McIntosh-Seymour Diesel Engine direct connected to 120 KW generator set and exciter.
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1—P. & H. Model-600 Gas Shovel 1-yd.
1—P. & H. Model-400 Gas Crane 35′ Bm.
1—Unit Gas Backhoe 33″ Bucket 1931.
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1—Universal mod. 35, ser. No. 1200, 56′ boom, ⅝ yd. bucket.
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1—12 ton Brownhoist gas crane No. 2, ser. No. 8881, 8 wheel, 40′ boom.

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4—Steel stiff leg: 1—15 ton Clyde, 50′ boom; 1—15 ton Clyde "A" frame hawse derrick, 50′ boom; 1—10 ton Insley, 80′ boom; 1—5 ton Insley, 80′ boom.
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36 x 42 Jaw Crusher
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155 bbls. Fuller cement bin, electric weigh batchers.
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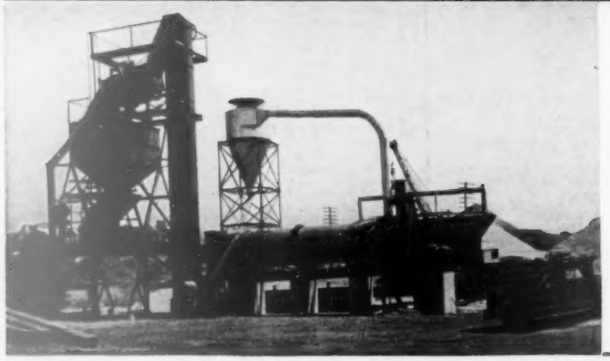

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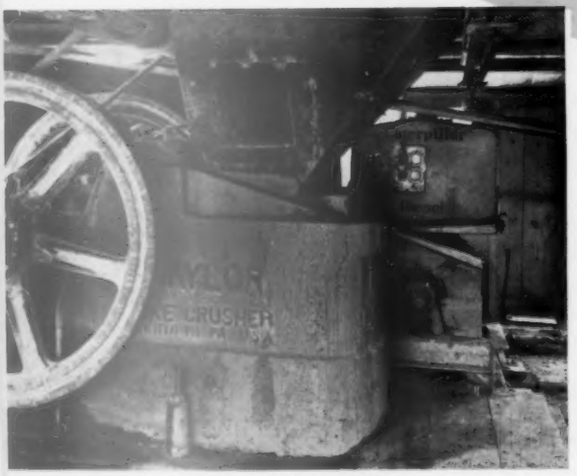

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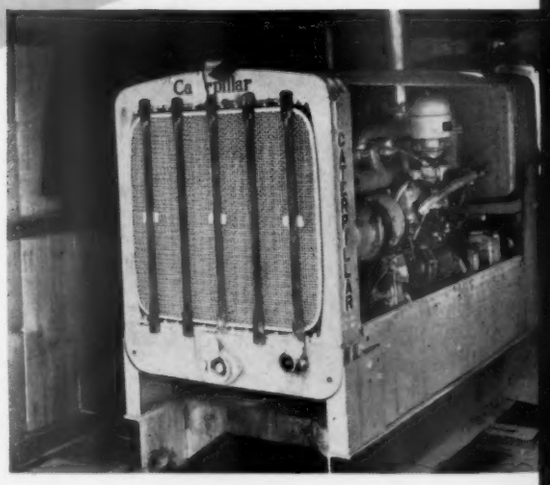

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